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JUNE 25, 1951

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Aviation Week

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Sperry A-12 Gyroplane takes over flying responsibilities for the two pilots necessary in the operation of the Navy's K-type airships.

NEWS DIGEST

DOMESTIC

Oril agreement on Foreign-National temporary airships (Aviation Week May 14, p. 59) opened last week with Pan American Airways saying that the exchange be delayed so GAA could consider PAA's proposal of a Foreign-PAA-Eastern airship.

National Airlines is considering purchase of a number of Martin 2-0-2 transport from Northwest Airlines, if the price is right. NAL President G. T. Baker said that his organization will study and investigate and has requested a 2-0-2 flown down to the main NAL base at Miami, and have concluded that this would make an excellent transport.

Massachusetts wage increases, averaging four percent, have been granted (Aviation Week) Co. employees at El Segundo and Santa Monica, effective June 18. The offer is the maximum permissible under wage stabilization regulations.

Lockheed F-94 interceptors are temporarily restricted to flights without top level pending determination of cause of crash of one of these planes in Long Island Sound (See p. 16). Wreckage of the plane for examination had not been recovered by midweek.

Navy's new ship, ZPN, made its first flight at Albany, Alaska. It was constructed by the Goodhue Aircraft Corp. The largest non-rigid aircraft built in the country, the ZPN is 326 ft long and has a capacity of 575,000 cu ft of gas.

Light-plane builders may get authority to use urethane materials on hard, poly-adsorbent aluminum under Contractual Materials Plan, permitting third quarter production for 1951 at the present rate of more than 2,000 planes annually, says C. R. Colford, Director of CNA's Office of Aviation Defense Requirements. The agency's request for fourth quarter effort would be on the basis of an annual rate of 3,500 planes plus or minus, if statistics justify it, he said.

Chance Vought will build an unspecified number of F4U Corsair fighters for the French government under the terms of the Mutual Defense Assistance Program. The Corsair will come off a production line now being opened for the U. S. Navy.

Marine Corps Air Station, Quantico, Va., last week, received its first Sikorsky HRS-1 helicopter. The helicopter goes to Squadron 261, but of three Marine squadrons on the East Coast which will

be equipped with helicopters in the next 15 months.

Striking PAA stewards, stewardesses, pilots and mechanics in New York City went back to their jobs after a three-day partial work stoppage. The stewards, members of the Transport Workers Union, claimed the airline had discharged 56 workers in violation of a "job security" pledge given at the time a new contract was negotiated last year. The airline had drafted work in its Miami overhead base, enabling a substitute in work force in New York. Agreement was settled when PAA agreed to hold pilots at other bases for the duration of employment. Only one flight was canceled due to the strike, although several were delayed.

FINANCIAL

Capital Airlines has earned a net profit of \$118,200 in April after provision for federal taxes, the fourth consecutive profitable month of the current year. Operating revenue was \$1.1 million, a \$75,400 increase over April, 1950. Net profits for the four months of this year total \$307,180 after federal taxes.

Lockheed Aircraft Corp.'s proposed 2-1 stock split has been approved by a majority of the company's shareholders. The company's book entered \$890 million at the end of its first quarter.

Electrol, Inc., Kingston, N. Y., reports net income equal to 60 cents per share for the third year ended May 31, compared with net income equal to 52 cents per share the preceding year. Net sales for the current period were \$3,471,507 compared with \$2,976,218 in the similar period a year ago.

INTERNATIONAL

International air routes are being sponsored by the Aero Club of Italy to begin July 15 at Athens, Italy, coinciding with the Viares July 22. Events include a 133-mo. closed-circuit spot flight for broadcasting purposes, a 621-mo. flight over a course yet to be determined. 175-mo. navigation test, out-and-back of the Alps, and circuit at Venice. Entries must be in on or July 5. Increased U. S. participation can obtain visas, regulations and official entry books from National Automobile Assn., 1025 Connecticut Ave., N.W., Washington 6.

Reserve/air MG 15 at fighters shot down by the Fiat Air Force totaled 65 in the 51-week period June 26, 1950, to June 15, 1951. FEAF reports. An additional 19 probably were reported, and damage to 122 others.

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SIDELIGHTS

Washington Observer

Mayhew's Rep. Street is pushing legislation authorizing women officers to be given priority in USAF and rear admiral in the Navy. Coming next is women rear admiral USAF colonel and Navy captain. Navy apparently contemplates such as the "open" designation for an air carrier, Fiscal Year. Legislation originally advanced to it in "the report card" Navy's Undersecretary Don Kneibitz said that the word he made "later" in the bill. It was. Senate Post-Office & Civil Service Committee is considering it, committee means whether to vote a bond to set aside postage or other costs in office. CMA may have a long way before it gets back to FY72 fiscal year, which starts July 1, and it leaves at Secretary of State Adams. Commerce & State are parts of the same appropriations bill and Congress is looking at appropriations money for their rates and said Adams sought.

People

Col. Charles Lambright is still named an USAF promotion with a special assignment in the Air Force. He has not yet had an assignment since Jan. 1. Working "on call" he serves without compensation and has performed numerous confidential technical services for the Air Force. Mark White, late of USAF public relations, is in the end because with his father in Newville, Charles F. V. Marley, formerly with York-Lite, but soon named special assistant to Chief of Staff Hays Vandenberg with rank of colonel. His past duty will be to assist in preparing material for public and congressional dissemination. Maj. Gen. Gordon F. Seville, scheduled to retire June 30 at USAF flight school at Fort Meade, will go on the lead cable business in a firm near Loudon, Va., to try a new method of fabricating cable for nuclear.

Air Force

USAF is contracting small businesses for participation in special contracts—except those "too large for small firms to handle." Senate Small Business Committee objects that USAF chooses contracts for planes, propellers, engines, and other electronic equipment in "too large" and three companies cannot be in 50 percent of all USAF buying. Headquarters for the new Lockheed Young Air Contract will be set up at the Civil Coast Military Academy with Maj. Gen. James A. Kneibitz AEF. Maj. Gen. David Schletter has been named commander of Allied Air Force in Southern Europe. He had headed RAD Command.

Navy

Three-class carriers Kneibitz and Henson, both 27,000 tons, are due for complete modernization, including, among other things, to handle heavier planes. Bureau of Yards & Docks also has bids for repair construction at Naval air stations totaling \$152 million. Construction includes strengthening of some runways of existing air stations to 30,000 lb. and new runways to operate at least 1, 5 air stations.

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RAF ORDERS SWEET SWIFT—First supersonic jet fighter ordered by the RAF is the Supersonic Swift, which will be similar to the Rolls-Royce Navon-powered F15 shown above. In case of the fact that Supersonic had planned the F15 to take either a Navon or the later, more powerful Rolls-Royce Avon engine, it is possible that the Swift will be powered by the later.

New Military Plane Picture Highlights



NEW FIFER CRASHCOVER—A large number of modern-ground Figer YL-35s (C15 by Lockheed) have been ordered by the Army, along with Figer L-15C.



NAUTICAL VENOM—The new D66 Sea Venom NF 30 all-weather fighter ordered by the Royal Navy for carrier duty has a 5,000-lb. Great SAB Ghost and hydroplaning landing wings. New add tailhook fitting onto the exhaust cone.



BIG AERONAUTION—An Air Force plane like "hounded" the Canberra B-57, having 12 PAW Way Maps, probably to outfit in Kelly AFB counterparts, who joined two General NC-76 (Aerostar Week Apr. 23)

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WHO'S WHERE

In the Front Office

Dwight A. Hess has been designated executive vice president and Director of Trans-Pacific Airlines. He has been with that Hawaiian carrier since it was formed in 1945 and was previously assistant to the president.

Edward F. Jans has been named assistant to the president of Curtiss. Jans, formerly chief life insurance correspondent in Washington, D. C., has spent 33 years in editorial department at the Capital.

Changes

F. W. Cass has been appointed assistant to the president in the general aviation division of Wright Aeronautical Corp. **J. E. McClear** has been made manager of General F-1 Works and engine control department. He leaves position of chief of operations being filled by T. E. Hoffman. **J. W. Roche** has been appointed chief of general control and **J. H. Depper** has been designated chief of material.

Stanley C. Hoffman has been made assistant general manager of North American America's new Columbus, Ohio, division.

Dean Walter has been appointed West Coast distribution engineering coordinator for Aircraft Division of General Motors. **George C. Rodgers** and **Irving W. Clark** have been named managers of the military sales departments of American Air Filter Co., of Melroe, Ill., and Lorraine, Ill., respectively.

Robert W. Sidel has joined the sales staff of Great Hydraulics. **W. Seagr** Seagr has been designated manager to the general manager of Kinross Aircraft Corp., and **John B. Bussey** has been made chief of research. **Miss Dempsey Terry Smith** has been made director of sales promotion and advertising for Air Equipment International. **G. D. Smith** has been named assistant co-ordinator for Mid-Continent Airlines.

Honors and Elections

Edward A. Spragg, industrial engineer with Ketter Corp., has been elected chairman of the new Manufacturers Advisory Committee which will work with the Research and Development Board on aviation mechanical design.

R. T. Chapman has been elected to the board of the Havelin Industry Group. He is managing director of Armstrong Siddeley Motors Ltd.

Alison B. Lundy has been named to the board of General Aviation.

What They're Doing

H. H. George Henson, general manager of Quebec Empire Airways, is setting on June 10 after arriving 10 weeks with the carrier. He has held his present position since 1945. New general manager will be C. D. Trench who joined Delta in 1954.

INDUSTRY OBSERVER

▶ Another Anglo-American aviation controversy is brewing, this one over competitive results of the new British four-jet Vickers 560 jet-propeller bomber, the Boeing on jet-B-47 propeller leader, the major production bomber dollar side, of the current U.S. procurement program. Argument is heated by British Flight magazine, which calls the 560, powered by four Rolls-Royce Avons based in the wing roots, "unarguably the finest bomber in the air today." Despite possibly longer on propeller aerodynamic merits of the very thin wing and good engine installation as the B-47 on the thicker wing, turbo-propeller engines within its thickness.

▶ A light amphibious trainer whose basic unit is an electronic computer has just been delivered to the Navy by Curtiss-Wright's Electronics division. This amphibious, designed for McDonnell Douglas training, will be housed below ocean decks and used to check out pilot in operational phases of the fight to come as the ship approaches the "baffle" area C-W in building similar units for many other types of aircraft.

▶ Republic Aviation Corp. reports that its F-84E fighter bombers are in action with the 27th Fighter-Bomber Wing in Korea, and operating in Germany, England, U. S. and (under MIAF) Belgium, France and The Netherlands. In Korea, the F-84E has exceeded USAF expectations as to itself. Republic reports. In its operation with full armament load and without rate of arrival less than 5,000 ft., instead of acquiring 9,500 ft. and rate as most USAF fighters had achieved.

▶ The 12,208-hp thrust jet engines of the future, which were included in the Lockheed L-193 jet jet transport specifications (Aviation Week June 15) prepared for U. S. airlines, are believed to be a version of the forthcoming General Electric J-53 engine.

▶ English Electric Co. has indicated to the Green L. Martin Co. that the second Canberra two-jet trainer bomber for Martin testing will make its trans-Atlantic delivery flight about the middle of July.

▶ North American F-86E jet fighters are back flying again after a tropical day grounding a few weeks ago to take care of some actuator trouble in operation of the reversibly hydraulic boost for the r-lying tail which is a distinctive feature of the L version of the Sabre.

▶ USAF is putting increasing emphasis on rocket-flying tests for its interceptors. Engineers avoid internal storage of rockets but flying tests without tests to avoid extra drag of extremely short rockets unattached under wings. The drag is an especially important factor in the high-speed jets such as the F-86, yet the thinner wings and the more lateral rate internal placement a problem too.

▶ National Bureau of Standards has developed a new method of analyzing exhaust gases from jet engines to determine their combustion efficiency. Method involves removing water and carbon dioxide increasing in the partially burned exhaust gas. This uncombusted remaining gas is burned in a special combustion tube. Combustion products are then weighed against those previously removed to determine the efficiency.

▶ A hydrolic brake to stop windmilling turboprops in cutter landings has been developed by Lockheed Hydraulic Co. and Armstrong Siddeley Ltd., builder of the Python and Double Mustang turboprops. AN's turboprops are used on the British Navy's Wyvern fighter and P-40 17 anti-aircraft planes. Brake is a light alloy disc, with spring force to stand high of temperature of the turbine, and has two braking shoes for a smooth stop without "grabbing" effect.

▶ An F-86 and Boeing Airplane Co. people are still and close a record long range jet flight that might have been last year's The No. 2 Boeing NE-47, with extra fuel tanks, after being used in the recent F-86 test still about bomb tests, was grounded for a similar return flight from Hickam AFB, Hawaii, to Andrews AFB, Md. It was scheduled to arrive at Washington simultaneously with Avco-Ford F-100 observations. But engine failures and breakdowns combined to cut seriously into the maximum range. It was decided to stop the plane at Miami AFB for repairs, and then it went to Wright-Patterson AFB, Ohio.

JCS: A New Strategic Plan

This is the budgeted thinking for the Joint Chiefs of Staff's new strategic concept, tailored to fit the Adm. Assistant's political and foreign policies.

• **Foreign challenge.** During the first five postwar years, the key to U.S. security was a strong and sure copic of a knockout atomic bombing of Russia. The key to Russian security means ground forces, larger than the combined armies of the rest of the world, capable of overrunning Europe and Asia.

The two factors cancelled out in a period of tension. Military power was in balance. Neither side had decisive strength.

The era ended with Russia's strategic expansion.

• **The new challenge** is to narrow the gap in Russian superiority in ground forces, while keeping the lead in superior military power. This means winning a fleet.

Restoring the bare for military power—air assets, sea power, industrial potential, land sea-through air assets, is now the heart of U.S. defense policy.

It's challenged by "go it alone" MacArthur opponents, mostly Republicans, who would build up an already overstuffed military at sea.

There are the revised roles of the military arms under the new JCS strategic concept.

• **Strategic air.** The medium bomber is the backbone of the strategic air arm. This encompasses losses through out the world to maintain the strategic requirement. The disengagement of intercontinental bombing by costly B-56s and B-52s was accepted to a Senate committee by USAF's Chief of Staff, Gen Hoyt Vandenberg.

"You would have to operate with two or three aircraft, you need more fuel, you would be getting, you would have to make it less cost out in the most dangerous that you want to be, the number of weapons that you could get would be greatly reduced, the amount of destructive material that you could carry would be greatly reduced because part of the load would have to be gasoline rather than bombs, which you would charge to bombs if you were close."

• **Seapower.** In aggressive role is to deter Russian ground forces with extensive operations in the Arctic, the Baltic and the Black Sea. By this strategy it is calculated that Russia in the matter of a sea would be able to reduce only 75 of an 175 jet line divisions for comparison of Europe—the best for Gen Douglas Eisenhower's confidence that he can "hold" the continent with 68 divisions plus tactical air support.

• **Ground forces** have an emphasis under the new concept of "holding" Europe and other allied areas they have not had in strategic plans since the end of World War II. Ground forces will attack actively, where ready for application, are marked for use in a European war with Russia.

• **Tactical air,** along with ground forces, is given an emphasis. JCS commitments approximately 60 European-based wings, with U.S. contributing around 12. USAF contributes 240, with the U.S. contributing 40 wings, and most of the assets for the total 340.

Inter-Service War?

Army, Navy, and Air Force are making considerable efforts to avert it, but an outbreak of inter-service warfare is on the horizon.

• **Air Force** is determined to a major buildup to 130 wings. JCS has approved only 95. And the Administration's \$19.5 billion '72 fiscal year USAF budget doesn't even provide for modern aircraft for those. USAF's Secretary Thomas F. White and Undersecretary John McCone, as well as its chief of staff, Vandenberg, are hereafter behind the buildup.

• **Army and Navy** are determined against it. They may go along with a modest boost of USAF units, but no more.

The USAF buildup raises a basic policy issue: Is the Air Force to be the primary arm with Army and Navy cost in available units? The 12-wing program would mean that USAF would get 50 percent of defense budgets. Army and Navy would split the remaining 50 percent.

This is the outlook now.

• **As for Russia,** Chairman of the Joint Chiefs of Staff has promised to 150-wing program to the Joint Chiefs of Staff for 1976—now to achieve it via through regular channels. Ultimately, it will get a revision, or a decrease not in force but.

• **The first step** may be likely to meet with such success. Both Gen. Vance and Chairman of the Joint Chiefs of Staff and Secretary of Defense Merrill, are reported to be with Army Navy.

• **The second appeal** to the Security Council—now have better results. This top priority gives will likely give substantial weight in the position of Gen. Eisenhower. He wants more limited air groups for Europe.

• **USAF won't push** an issue in Congress while there's still a ray of hope of achieving it via through the regular course. This might mean that the battle of the 150-wing USAF will be postponed until next January.

• **As for Sea,** Heavy Cabinet Lodge plans to sign a \$2-billion addition for USAF when the '72 fiscal year military budget comes before the Senate, some time this year in April.

• **The Lodge proposal** will advocate in the Pentagon, starting Army and Navy chiefs of staff who have selected the JCS decision in the letter.

• **Meanwhile,** The Ford-Walsh action that has been spearheading a "base or power" campaign as the Senate is coming on the 150-wing USAF buildup. They're all-out for intercontinental strategic air power; that is, in comparison to Europe. U.S. ground troops are the key to support in Europe for a "hard war." And the 150-wing program emphasizes tactical air groups for Europe.

CAB Friends and Influence

Sen. J. William Fulbright and Foreign Committee Chairman Sen. Edwin Johnson are leaving an investigation into supposed unfair influence at CAB and the White House as "ages ago"—indisputably. Fulbright goes down to the ground level's practice here to gain more info.

He won't consider such an investigation until after controversial legislation concerning annual pay (two sub bills) is cleared, Johnson says. That's likely to take several months.

The prospect is that there won't be any investigations at all.

The general report on Capitol Hill is flat, though some of CAB, the investigation would hit the White House.

—Katherine Johnson

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Atom Blast Studied as Key to New Design

Evaluation of explosion effect on various military planes may guide future plans.

By Ben S. Lee

Speculation as to what new military aircraft designs and structural changes will be called for following the pending evaluation of Atomic Energy Commission's recent Joint Task Force III weapons test at Eggenwald AFB has the industry buzzing.

But while the industry awaits the new design criteria, JTF III has made public the fact that it is in little radio-quiet mode, following an atomic blast. All aircraft, vehicles and facilities areas surviving the blast and still operational could be immediately assessed and sent into combat. The significant material damage to low-level aircraft would be confined to an area 300-400 yd in radius, Gen. James T. Moore, spokesman safety advisor of the task force, announced. Writing this was there would be no impact what, as everything would have been vaporized.

In a first interview with press since the report JTF III was organized in 1960, Lt. Gen. Edward B. "Pete" Quast, Commander Joint Task Force III, Gen. Dean, Air Force Weapons Coordination Chairman, Dr. Alvin C. Gove, director of Test Div., Los Alamos, and Gen. Thomas have reported an general trend: The results of the latest weapons test program.

Gen. Quast reported that some 112 aircraft representing 15 types of aircraft and other plans including the jet jet engine B-70, B-17, B-50 and Lockheed T-33 jet trainer were exposed to varying doses of blast and heat.

• **Evaluation Data—All** of these planes were instrumented, Quast said, to record stresses and pressures for complete evaluation. This information will be valuable in establishing new design criteria for combat aircraft as well as in developing new tactics for operations in the close vicinity of atomic blast.

Contrary to some published reports about the weapons test, Quast says that bombs are the current source of both all the blasts were fired from steel towers erected at the site. The number of blasts was not disclosed.

Observations covered such as Boeing B-17s and early Lockheed T-33 trainer

versions of the F-105 were equipped with electronic dose control mechanisms so that recording instrumentation could be flown directly into the blast area.

Instrumented aircraft such as the Boeing jet KB-47 (Numbat) two instrumented versions of the production B-47, the Boeing B-52A and D were flown at close distances from the blast area but were fully instrumented to record effects of blast, heat and surface stresses.

Exact patterns flown by both doses and material arrival in and around the blast area is still classified by AEC. However, it was reported that the planes were flown at various altitudes and distances from the blast so that a complete study of blast effects could be obtained. In performing each flight-test blast mission 12 doses are

craft were used, including 30 Boeing B-17s and 2 Lockheed T-33 jet trainer.

• **Annual Employment** By type, aircraft used in Joint Task Force III included 33 Boeing B-47s, 15 Boeing WB-57s (Numbat), 15 B-52s, 15 Boeing B-56s G-A versions and 2 D versions, 12 Boeing B-17s, 1 Boeing XB-47, 10 Lockheed F-105s, 10 Lockheed T-33s, 1 Lockheed F-106, 3 Grumman SA-16s, 1 Douglas C-54, 1 Douglas C-47, 16 Convair 4-40s, 4 Stratoliner L-5s and 4 Mustang F-4s.

Of the total number 22 were damaged. These included 5 F-105 jets and 17 B-17s. The L-5s, L-5s, and B-56 versions were used as interdicted air assets.

During the entire operation, three F-105 losses were lost. One was crash landed on an inland strip in the Eggenwald field, and two others were reported to be damaged but could not be recovered below 40 percent of full power and its instruments were recovered. As in other dose operations, the planes are flown off the

Pilot Strike Ties Up UAL

The worst-aided air transporters take attention an inquiry toward jet with Pilots on United Air Lines already were on strike, the same time that touched off the UAL situation. The pilots are in Air Line Pilots Assn. negotiations with American Airlines and TWA.

All pilots will be legally able to strike today. Some TWA and Eastern pilots also have talked of striking. (The new) pilots would be without passenger air transportation.

The welfare of all UAL pilots June 19 showed nearly two years of down-out negotiations between UAL management and the Air Line Pilots Assn. (ALP) over wages and working conditions.

Chief stewardess kick a bonus of \$100. The management offers for 85 months the pilots may 70.

Some UAL pilots say they would probably strike on the new pay even if they were not on the pay deal. The deal is being negotiated by the PMA dental insurance. Best deal worth (American Wire page 11-1) that per seat for less than \$1000.

But United management wants to stick with the 55-hour week in effect since the 1950s. The pilots agree 70 hours today is comparable to 55 in those days. Working conditions have improved that much, especially in industry, and the airline pilots job has become more attractive than DC-10 to DC-80.

The strike started after service on all the landing UAL routes from New York to Honolulu.

The strike came either suddenly on vote of the UAL pilots strike committee at Chicago, subsequently approved by ALP.

U.S. Senator Edward Brooke called the strike an unconstitutional one. ALP President David Beland declared that the strike complied with terms of the Railway Labor Act. Two years of negotiations is a long enough working period, the pilot's spokesman said.

Key factors in earlier negotiations have been the pilots' demand for a monthly (weekly) limitation on flight, instead of an hour per month, and a new pay arrangement for standby duty time.

ways under control of a ground operator and then switched to electrical control, which was set up on the plane for the remainder of the flight until landing procedure is begun. At that time control is switched back to a ground controller who completes the landing operations.

Other aircraft used during the operations were a B-17 bomber and one L-11. **Experimental Unit**—Air Force experimental operations designated as Task Force 1-4 were under command of Major Gen. Robert M. Lee with Col. Wilbur T. Miller as his chief of staff. Mission of this group, General Quisada said, was to handle operation of all experimental aircraft, including the descent and autorotations used in the final measurements.

Gen. Lee also controlled the B-17 bombers used as radar collectors which Quisada said were essential to the overall experiment. In addition, Task Force 1-4 was responsible for providing for weather spotting, reconnaissance, search and rescue, liaison and services within the 49th and F-30 interceptors far in advance.

Gen. Quisada pointed out that the complex nature of operating aircraft on a tight-schedule timing schedule in relation to destination was staggering. The very latest developments in radio detection and location were carefully considered, he said, in their use for locating or control.

Task Force 1-1, under the command of Rear Adm. Richard H. Coates, with Capt. Harry R. Blom as Chief of Staff, was charged with providing oil-burn as patrol and search device. The chief, Quisada said, also was responsible for transportation of personnel and cargo within the study harbor drainage and floating fuel storage. Navy personnel involved in the overall program totaled 2,370. An Air Force personnel involved in the operation number approximately 2,400.

Defense Messengers—Gen. Quisada said that there was no intention that any unidentified aircraft or surface vessels had attempted to enter the restricted area during the exercise. During the course operation and that several defense forces had been adequate enough to handle them if any had.

Supplies for establishment and maintenance of Joint Task Force III were provided by the Military Air Transport Service and the Navy. MATS, despite the drain placed upon it by the Korean war, Quisada said, handled all passenger service. The Navy provided the aircraft and in addition supplied some 3,900 tons of high priority cargo. Surface units of the Pacific fleet, he added, moved 250,000 measurement tons of ground cargo from the West Coast to Eniwetok.



BACK TO FRONT: Aft section of 404 hauled into place for splicing to main section.



ON HALF-SHELL: Blast-up gaps metal floor in 202 is needed for 404 pressurization.

Production 4-0-4 Nears Flight

First new airplane, built with 80 percent new tooling different than that used for 2-0-2, marks design steps.

By Alexander McNeely

Rethink—Tooling for the new protracted Martin 4-0-4 has meant that part is 80 percent different than that used for its predecessor, the 2-0-2.

Designers, project engineers and production specialists at the big Glenn L. Martin plant say that is a good indication of major change, indicating adaption to airplane building, which have been put into the new airplane, aerodynamically, structurally and component-wise.

"We aren't selling the older 2-0-2 short," Wilbur Steyer, vice president, engineering, explained. "But the state of the art actually has advanced considerably since the first 2-0-2 and other

contemporary airplanes were built at the end of the war. We are trying to get as much of those advances into the 4-0-4 as we can."

Final Assembly—A recent test trip down the 4-0-4 line here under guidance of G. T. Wiley, vice president, manufacturing, showed the first five final production 4-0-4s were in the final assembly line.

Wiley pointed to detail parts and sub-assemblies further back which indicated that parts for 17 equivalent airplanes were completed. That means Martin has made the parts for its fifth block of 15 planes and is started on its second production block of 25.

Ode's new stand at 101 manufacturing plant and two executive interior Const



FRONT TO BACK: Forward fuselage sections hauled up behind tail section in Martin plant.



IN VIEW, MIDDLE: Wings and motor sections of 4-0-4 start movement to final assembly.

Guad 4-0-4. The conventional order are divided between TWA World Air Lines, 51, and Eastern Air Lines, 50 Martin as well as Air Force and Navy lessons for an aerial 4-0-4 military version but hasn't anything firm on it.

More the original 4-0-4 skeletons look about three to four months and you will have a new resident side of the schedule Martin now expects to meet. The first 4-0-4 is expected to be flown by the last of June or the first of July. First two deliveries to TWA had been scheduled for April. The defendant's good part of it might be attributed to delay in procurement of equipment, after the early schedule had been substituted. And then there have been some materials and components problems.

Material Shortages—Wiley showed one example of shortage.

The supply of castings for flap-operat

flaps suddenly dried up. If Martin had wanted for long, it would have looked the line. To keep that flow kept going, some dummy fittings were milled and put in place. Then, at noon in the additional exchange period, the dummy milled fittings were pulled and replaced by the permanent production several stations down the line.

That it wasn't quite that simple. The reason for the shortage in shipment of castings was lack of material. Martin said the emergency expedient of supplying the necessary eight meters to the factory to get the rest of its castings.

Wiley doesn't think the shortage problem will meet up his schedule especially now he gets it rolling, bearing a considerable percentage of the situation. The original plan called for production to reach a maximum output of eight planes a month by September and

constant at that level. If all goes well next year, that means that the eight planes-a-month schedule may be reached in December, or January.

Indicative of the accuracy work which Martin is doing on the new airplane is the elaborate static test setup which is being operated in a big machine house. Here the test structure by complete 4-0-4 has been going the whole in a series of pressurized tests. It is one of the largest positively stressed static test operations in this country, perhaps exceeded only by the Air Materiel Command Static Test Building at Wright-Patterson AFB.

While the 4-0-4 test is going along in one part of the big hangar, deep holes on the leading edge of another manufacturer's plane are being machined simultaneously, and another Martin plane, meanwhile, is getting ready for additional stress tests.

Pressurization Test—Yet to come in the subdriven pressurization test for the static test 4-0-4 loading. This is believed to be the first test of its kind in this country, but it was tried before by British manufacturers. The idea is to submerge the fuselage at the end of the dock in Middle River and pump in pressurized air to catch the air leaks.

As a stress testing order, Martin has conducted a stress operation but few so far built for water-tightness, and isn't expecting much difficulty as the new test.

Manful of some difficulties experienced with 78ST airplanes flew in the earlier 2-0-2, Martin engineers have provided that as 78ST instead will be used in tension. Bryan thinks the new 4-0-4 has the lower stress level of any 10-5 transport with the possible exception of the old Douglas DC-3.

An important structural change aimed at saving passenger weight is a new high efficiency drag-back door strut which is incorporated in the 4-0-4 landing gear. It was developed by Martin to improve a Navy position given a contract to develop the landing gear of twin beach RBZ trainers. It has already been flight tested on the RBZ and is its largest version on the Martin 4-0-4.

Another 4-0-4 test plane which is a modified 2-0-2 lengthened and with structural configuration of the 4-0-4. It comes pretty completely, a complaint by some pilots about the stiffness of the old 2-0-2, says the Martin engineers say.

Aerodynamic Changes—Aerodynamically there have been a number of changes made in controls from 2-0-2 to 4-0-4.

Rear shape has been changed, but has not been increased, resulting in an increased ability to hold single-engine speed down to at least 102 mph. A good decrease in pitch forces down to 100 ft. against 100 ft. allowable by CAA.

Flaps have been modified to reduce

difficult attracting workers and had a high turnover of those it did get.

► **No "Frags" Benefits**—This first contract with the IAM also included an "Injury" benefit. There approved by WSA are (1) A seventh paid holiday (Election Day), (2) Pay while on any duty, and (3) An extra day's vacation for those workers on a 45-hour week. WSA held up action on those offers. (1) A switch is night shift differential from 10 cents an hour to 12 percent (resulting in an additional seven cents an hour), (2) Pay for any day of the five sick-leave days not used, and (3) Absorption by the company of the worker's share of the cost of the group insurance plan. These offers amounted to about 2 cents an hour.

Laborists never believe the absence of incentive to hire workers into an extra plant is a major cause of the difficulty in labor recruitment, hence, in the absence of manpower controls, the job may have to be done through higher wages. There is little doubt there is some unexploited work site aircraft plants, they point out, and industry has little to offer in the way of a permanent job when the war threat subsides.

Members of the WSA committee are:

- **Public representatives**—James West Coast legislator, and Howard S. Koltz, professor of the University of California Industrial Relations Institute, formerly with Curtiss-Wright.

- **Industry representatives**—Robert Dixon, vice president for industrial relations at Consolidated-Vultee, and Donald W. Stearns, manager for industrial relations of Clevite L. Martin.

- **Labor representatives**—John W. Lutz, labor union leader, who had been head of the CIO Auto Workers Aircraft Department, and Dale Reed, West Coast General Lodge representative of the IAM.

Oakland Clinic

The first small-business show in West draws 53 exhibitors.

Oakland, Calif.—The Armed Forces Regional Council Oakland Clinic here produced 53 exhibitors, including government agencies and private contractors. Close to 3,000 representatives of small plant firms Washington, Oregon, Utah, Nevada, Arizona and California were present at the small business show. This was the first of these small business clinics to be held in the West.

Results of the four-day meeting aren't yet complete, but major contracts and possible future plans, discussed at the start, closed their books with average

project lots in their lineups. Many will expect small plant facilities before returning home.

The small business man left the clinic feeling he had had his day in court even though he didn't have a signed contract. Although many national firms provided bids, they were disappointed at the total number of contracts which were made.

► **Under-Promoted?**—Complaints were heard that the clinic had not been properly presented—that not enough time had been allowed for plans and preparation. Although several representatives got to the registration stage, a backlog of some contractors' proposed files was a major business. This was particularly apparent before defense orders and not to contract saw on the books.

Obviously, major defense companies had previously accepted the War for auto and land contract, the clinic with slight hope of securing anything useful. But they found evidence of shops capable of doing precision work and development engineering.

Several plans with electronic problems found undeveloped sources of supply in many small manufacturing plants centered on the San Francisco peninsula. Plastic fabrication was noted. Many of the exhibitors were from the Los Angeles area where available jobs are beginning to disappear, and the clinic produced prospects from their own backyards that had been missed in their local searches.

One last feature of the clinic was the salesman who got credit to the fact that it allowed a chance of a lifetime to contact many purchasing agents in a small area and short time. Evidence to the exhibitor was for anyone who could produce a business card and equipment salesman can always manage to accomplish that.

Many exhibitors complained that they had not managed talking to visitors while the small business man they came to see waited.

Probably the most benefit from the clinic went to firms with new defense contracts and without World War II manufacturing experience. There had a quick change to locate numerous sales with available shop time and equipment.

Most of the subcontractors were satisfied with the clinic. There had been hardships that small business wasn't getting a fair chance at the defense work that they had heard so much about. But at the clinic, they had the prime manufacturer's best deal opened and a chance to discuss their problems. Many shipments went to hotel rooms each night for study. Two smaller Armed Forces Clinics are due to open in the West this week, one in Seattle and one in Los Angeles. Plans call for another in Los Angeles in September.

No Changes

All members of JCS to remain; Vandenberg denies plans to retire.

The present officers in the Joint Chiefs of Staff will remain their posts for at least another year at the latest appointment of Inspector General Omar N. Bradley is confirmed Aug. 15, a Pentagon spokesman said last week.

Bradley, it is reported, had planned upon retirement Aug. 15, following completion of his tour of duty as the first Chairman of the Joint Chiefs of Staff. But President Truman prevailed upon the general to keep his post for another two-year term to write a classic U. S. military policy outline during the current tense international situation.

Personnel thinking on Pentagon policy levels was that Bradley would step down and that the post of Chairman JCS would pass to Admiral Forrest F. Shoup, who is Chief of Naval Operations, a new member of the JCS. If this plan had been followed, Admiral Robert H. Canine, recently appointed North Atlantic Treaty Organization commander for Southern Europe, would have been named Chief of Naval Operations replacing Sherman.

► **Vandenberg Deal**—As Force Chief of Staff Gen. Hoy S. Vandenberg had returned from a meeting with NATO chiefs in Paris, drafted that he was planning immediate retirement to accept a top civilian job in response to a query from Arthur Winters, Co. military operations had again in Washington military and industry circles that Vandenberg would retire June 30 to accept civilian employment (Aviation Week June 18).

Gen. Vandenberg returned last week to meet inspection tour of United States Air Forces in Europe and a conference with Lt. Gen. Latour Nantel, commander of USAF. Vandenberg had gone to Paris on June 9 to meet with the chiefs of staff of Canada, France, and the United Kingdom, to discuss policy and plans for the six defense of Western Europe. Results of this discussion were not disclosed.

Vandenberg, according to a source close to him, plans to accept in the Air Force for another three years until he has 30-year tour of duty has been completed. In light of the worldwide appointment of Bradley, to hold the present JCS body intact, Vandenberg will also very likely be asked to continue for another term as USAF Chief of Staff and a member of the JCS. Vandenberg's present tour of duty as Force Chief of Staff is up in April, 1952.



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F-94: Variations on a Lockheed Theme

The basic F-80 airframe, in its various modifications, may lead a trend back to straight-winged fighters.

By David A. Anderson

McGuire AFB, N. J.—This month the 52d Fighter All-Weather Wing completes its first year of operations with F-94A aircraft. During the past year, the squadron has conducted many missions. They have tested up reliable job-training time in the aged aircraft use of all-weather fighters. The crew are familiar with radar equipment, gunnery and afterburner. They have gotten to know their aircraft.

The F-94A is a new airplane only in the fuselage, its wings, tail surfaces and landing gear come directly from the same age and tools that made those parts for the F-80 Shooting Star. And most of the changes in the fuselage over their origin is the change of powerplant from that of the F-80 (and its two sister trainer development, the T-33).

The remainder of the changes have to do with the mission of the craft. Coastal Defense—Several units south of New York, two squadrons of F-94As of the 52d stand on a war footing. Their mission is to defend con-

tinental United States against air attack, specifically they work within the boundaries of the area assigned to East Coast Air Defense Force.

Two combat squadrons, the 2d and 10th, make up the 52d Fighter Group. This group, together with a maintenance squadron, an air base group and a medical group, all having the 52d's emblem, make up the wing.

Operations of the 52d are tested. The wing maintains a 24-hr. alert, with planes on the line, pilots in the alert room, and arms in the gear.

When an unidentified plane is picked up by the East Coast radar system, ground control intercept (GCI) places a signal to the alert room. The signal goes to the head of the standby plane and its altitude.

The pilots scramble to their planes. Once airborne, GCI guides them to within the range of their own radar equipment. When the F-94 radarman picks up the target, he takes over from GCI and guides the pilot until the pilot is within visual or radar range of the unidentified aircraft.

Pilot's posture is much like that of the F-80, with the exception of the added gear necessary to the mission of the plane. As an example, the afterburner switch has been located on the left side forward of the throttle, and a new gunnery and pilot's radio scope have been mounted on the forward fuselage deck, just below eye level.

The instrument is wedged in place by his engagement. Once actuated in his seat, he lifts his radio slightly (the emergency is single latch) and swings it down to his eye level.

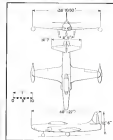
Both pilot and reference seats are of the ejection type.

Altogether Engine—Powerplant of the F-94A is the Allison 38-D20 (AF designation J33-A-13) turboprop with Allison afterburner. Thrust rating of the engine is 5,100 lb without afterburner. The afterburner begins just downstream of the engine turbine with a ring of fuel nozzles. About a foot farther down is a burnerholder, made up of annular rings and radial vanes of V section. The open end of the V fans downstream. Pressure of the burnerholder is to create an area of local turbulence which will hold the flame at the base of the burnerholder.

The tail nozzle of the afterburner is equipped with a two position nozzle, actuated from the afterburner controls.



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in the front cockpit. The afterburner is either on or off, there is no intermediate throttle position. Consequently, the speed is either fully opened (for maximum acceleration) or partially closed (for reduced speed).

Two jets between can be fitted in the body of the F-94. These are fed in the pilot from a switch located at the rear right side of the cockpit among his instrument switches.

The philosophy on this jet exit area. It would seem that a conventional area, say, like Rats, would be controlled from the same location as the other propeller controls. But when the pilot needs it, he is operating the plane with his right hand, working the thrust levers and afterburner with his left. Thus he need reach forward and to the right to hit the Rats-Song button, which must be an awkward duty.

►Fuelage Design—Installing the new engine/afterburner combination made it necessary to redesign the entire fuelage aft of the back-of-the-seat at which the fuelage is transported to permit removal of the engine.

The increased diameter of the afterburner lower that of the tailpipe (tailpipe) changed the center of the aft section of the fuselage by way of nearly constant diameter. On top of this new tailcone was mounted the tail assembly, consisting of the standard F-80 vertical and horizontal surfaces.

Because of the increased heating effect caused by afterburner operation, it was felt necessary to obtain part of the aft fuselage with stainless steel. This new skin began at the baggage door and the leading edge of the keel and ran forward to the remainder of the fuselage.

Using the afterburner means more weight so than under normal conditions. Consequently, the exits and doors had to be increased in size when the propellant chamber was inside. The exit inlets were modified to increase their area, and at the same time, the duct lip radius was decreased.

Inside the center of the fuselage, the dual depressions were increased both vertically and toward the rear portion of the plane, in order to handle the increased volume of air. Doing this meant taking volume away from the baggage fuel tank, but this has been more than compensated for by wing tanks.

►Eye Telescope—The gun camera on the F-94 is located in the nose just under the radar scanner. It was moved into a position within the center of the right eye console on the F-94 at the time the ducts were modified for the F-94.

Just forward of the windbreak in the baggage door is an airfield ballhead. In this issue of the F-94 is introduced the nose assembly section. On the F-94, the nose is entirely new although this

frame forward. A hollow plastic housing at the forward tip covers the radar scanner. Forward to the frame behind the housing is the airfield ballhead and to the left of supporting structure between the two, is a collection of "black boxes" containing the radar, its drive and guiding equipment necessary to the mission of the F-94 attack.

But all this equipment has not been housed without paying some kind of a price. In the F-94, the trade was for two of six guns, leaving the plane with four 100-cal machine guns.

►Performance—Some speed figures have been released on the performance of the F-94. It is listed as the 428 mph, does a level cruise on top of over 45,000 ft, and a combat radius of over 500 mi without tanks.

However, another source says that the performance of the F-94A is markedly different to that of the F-80 and the F-105. This would place the maximum speed at about 530 mph.

Four models in the F-94 series have been announced. Briefly, they are:

- F-94A, which is described here. For purposes of record, the aircraft at McGuire AFB bear the complete designation of F-94A-110.
- F-94B, like the A model, but including additional forward gun. Some of these planes are being delivered to Alois Air Force Command.
- F-94C, which is a redesigned model featuring a thin wing (5 percent or so), a Pratt & Whitney J-48 turbojet with afterburner, and a two-sphere horizontal tail.

►F-94D, which is to be a single-place version of the F-94. The radio operator's position will be taken by extra fuel, the plane will have the thin wing of the F-94C and the J-48 engine. Its maximum fuel will be ground support at long range.

And this isn't necessarily the end of the list for the F-94 variants. Lockheed has more power the versatility and adaptability of a good firm—the F-80—by providing it with two different and exceptional planes—the F-83 and F-94.

The philosophy expressed by the design of the F-94C, with its straight wing and swept horizontal tail, is that if a wing can be built thin and strong enough, there is no need for sweepback to eliminate compressibility effects. And further, leading qualities of high speeds and maneuverability of high altitudes will speeds need not be required as a compromise with sweepback.

If this proves out in service, Lockheed has another good basic configuration to start with. It could start the beginning of a transition back to the straight-winged aircraft. And Lockheed, by presenting efforts, could be leading the rest of the industry in that direction.

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Flexing the Stratojet's Limbs

Being withstand turbulence have latched out some of the aerodynamic characteristics of the B-47 Stratojet with a new aircraft technique. These require skilled from the traditional high-strength metal to one fabricated from aluminum alloy, brass and other lightweight materials in an arrangement to duplicate the flexibility of the full-scale plane.

These types of tested tests were set up:

- Effect of aerodynamic on the static stability and control characteristics, determined with the model mounted on a rigid support.
- Dynamic stability testing, by flying the model with varying restraint while providing several degrees of freedom

for the type of problem under examination.

- Flutter analysis, conducted with all types of model supports.

Load weights located in small inert sections of the model were used to simulate fuel and bomb loads. And transparent plastic tanks were attached to duplicate fuel sloshing effect under turbulence or buffet. High speed motion pictures were taken to correlate with test data.

For flight investigation of a typical aerodynamic model, the tunnel was fitted with a vertical steel rod from floor to ceiling, so that the small plane could freely fly up or down the rod, so that a small control on the model gave elevator control.

Sheet Hardness Tester Streamlined

Hardness testing of small sheet metal parts has been streamlined at Finchel Engine and Machine Corp. to meet the high-speed demands of the C-119 Twister production line.

Finchel's pointed in production line how with the machine design, knock edge of the Toplight Tool Co., Inc. and the result was a job-tailored auto metric tester and cradle that does the work of five operators, giving a saving of 800 man-hours per year.

Situated at the outboard control point of Finchel's small parts plant, two of the machine's sheet hardness and cradle with the conveyor strip the sheet metal parts processed.

The machine's hardness testing unit is a specially adapted Russell instrument with a range between 131 and 135 on the Rockwell scale. The machine is set for the material thickness and necessary hardness required by specifications, and parts are held in under the indicator point, which moves up and down at a rate of 90 lines per minute. Those that measure up are automatically stamped and a meter counter on the base of the machine tallies only those parts that meet the specs.

Also contained in the base is a dial for visual reading of hardness.

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NACA Reports

► Effects of Stress Solution Treatments followed by an Aging Treatment on the Life of Small Cant Gas-Turbine Blades of a Cobalt-Chromium-Nickel Alloy, 1-6-6 feet of Solution-Treating Temperature (TN-2120) by C. Yaker and C. A. Hofmann.

Time to first overtaking of jet engine is limited by the short life of turbine blades, among other factors. Currently, most jet blade alloys have relatively short first failure lives, at still an great uncertainty of performance. Previous investigations have indicated that heat treatment would improve both blade life and high temperature strength.

NACA's Lewis Laboratory began investigating cant turbine blades to determine the effects of a series of heat treatments on their life, performance uniformly and first failure time. The alloy studied was AMS 3165; it was chosen because it is a material of current interest, and because it is one of a class of powder alloys and might serve as a design base for a class study.

Blades were solution-treated at temperatures of 2,100F, 2,200F, and 2,350 F followed by aging at 1,600F.

As a result of these treatments, NACA says that:

- Improvements in stress life and time to first failure were obtained and were confirmed by statistical analysis
- Improvements in uniformly over an arc of blades were obtained, but stress local analysis did not indicate these improvements to be significant —DVA

► Extension of Low-Speed Lift and High-Mach Parasites for Full-Span Tip-Edge Flaps on Lifting Bodies With and Without Sweepback (TN 2250) by John B. Doh, Jr.

This investigation was largely in accord with previous theoretical lift/sweepback theory to the calculation of lift and longitudinal coefficients for swept-back wings. Existing methods of using lift/sweepback theory were compared by calculations made to the swept set of conditions, and the most promising method was then considered in greater detail.

The theoretical analysis was limited to:

- Linear variation of sweepback coefficient with angle of attack and flap deflection
- Full-span, constant percentage chord flaps
- Internally sealed reflex flap
- Low Mach speeds

The present method is based upon lift prediction made by the Wüstering method (NACA Report 321, 1940) and upon extension of standard

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center aspect ratio conditions. These subjects are made up to the large-moment coefficients by using the method of Feltner (British R. & M. No. 7710) for computing the loading on the lifting surface. Design charts are presented for the induced-center conditions to illustrate the extensive capabilities for lifting surfaces—DAA.

►Lift, Pitching Moment, and Span Load Characteristics of Wings at Low Speed as Affected by Vortexes of Sweep and Aspect Ratio (TN 2284)—by Edward J. Hopkins.

These are experimental results obtained on one of the 7 x 19 ft tunnels at Ames Aeronautical Laboratory for various combinations of sweep and aspect ratio.

The general results of the tests led to these conclusions:

- Longitudinal stability at moderate to high lift coefficients is improved with reduction in aspect ratio of swept wings.
- Angle of attack for maximum lift coefficient increases with angle of sweep, but this increase is less for wings of lower aspect ratio.
- Aerodynamic center is moved forward for increases in sweepback or sweptback for all aspect ratios.
- Sweptback wings carry the greater portion of the lift near the tips and swept-forward wings carry the greater portion near the root, as compared to straight wings and at all aspect ratios.

• Agreement between Weissenberg's theory and these experimental results was good for induced drag and for spanwise control-pressure distribution. The theory slightly underpredicted the lift carried over the outer portions of the wing. —DAA.

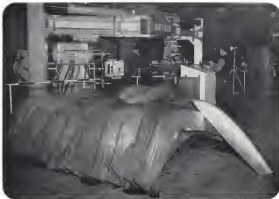
►Analytical and Experimental Investigation of Effect of Twist on Vibration of Cantilever Beams (TN 2300)—by Alexander Mironov and Sergey Gaiduk.

The investigation necessitated by this Tech Note was initiated because of the increasing interest in the vibration studies of turbine and compressor blades, and in the determination of natural modes and frequencies.

The note presents a method for determining the coupled modes and frequencies of anisotropic twisted cantilever beams and to determine the effect of twist on vibrational frequencies.

For a beam with bending stiffness ratio in the two principal directions equal to 1/4, the first natural frequency is raised by a negligible amount due to twist. For the second mode, the natural frequency decreases greatly with increase in twist. Similar effect holds for the third mode.

Good agreement exists among the developed method, exact theoretical solutions and experimental results—DAA.



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Rocket Linings

Recent research points way to early solution of ceramics problems.

By W. H. Duckworth
and H. Z. Schatzfeld*

Outstanding progress has been made in the past few years in ceramic linings for rocket nozzles. As late as 1946, the best required by waste nozzles on a particular uncooled motor was something like 26 sec with a propellant-chamber temperature 1,000° below optimum.

Today, ceramic linings have extended the service life of this motor beyond the limit of available testing facilities. Optimum propellant nozzles and tests of over 2-msec duration do no damage to waste linings.

These results are quite encouraging. But, firing tests on this and other cast metal motors have not been carried far enough to be considered much more than demonstrative.

How Long?—For example, we do not know how long we can fire continuously in many cases. For some liquid fuels, the major vaporization problem of sprayed linings has not been solved, although theory and some experimental evidence lead us to believe that it is not critical.

If a ceramic is sound after two or three cycles, it will probably withstand unlimited cycles. However, such experimental conditions as dropping section or gas infiltration between the liner and shell might weaken the construction and cause failure.

Injection drugs, use of waste propellant and chamber pressure increases will influence the performance of a ceramic lining. The effect of these variables has not been investigated in detail in service tests. For the most part, the tests have been confined to wastes of 20- or 1,000-lb thrust, using nitric acid and sulfur, sodium, or sodium, and chamber pressures of 500 psi.

Usual Cause of Failure—A consistent feature of the mechanism of failure shows that proper evaluation need not almost solely on service tests. Ceramic linings had more often be brittle fracture from thermal stresses. All of the controlled service variables mentioned above, except repeated firing, influence brittleness, which in turn limits the range.

*And Research and Development in Rocket Motors, Convair Division, Division 20, Convair Division, Convair, Inc., Fort Worth, Texas. Convair is a subsidiary of General Motors. Convair is a member of the American Rocket Society of the American Rocket Society, Inc. U.S. Patent 2,512,211 issued to Convair, Inc. with American Rocket Society.

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tube of the induced thermal stress. In view of this, the heat-transfer problem is as important in conventional welded joints as its cooling portion, and much less tractable. Even with steady conditions, a useful indication is entirely. The pretense thermal and mechanical properties of stresses are not nearly decreased and, unlike metals, are usually complicated by purely nonmechanical.

All strength criteria are questionable in the case of composites. Further, the complex configuration is made a beyond any present derived stress analysis, even with a simple load-flow pattern. Composite Materials Analysis on linear structures contains and the development of new stressors have been made in many less acceptable to fracture by derived stress. Further progress along this line can be expected with continued research. The derived physical characteristics are well known—a combination of high strength and high thermal conductivity with low thermal expansion and low Young's modulus.

The possibility of a ceramic which does not exhibit brittle fracture appears unlikely. Ceramic materials might "sag" under stress, but the heat is applied too fast in a rocket motor for any sort of thermal stresses by this mechanism.

• Breakdown. Several engineering offers appear to be a more reasonable answer to thermal stress problems than a change in material. Qualitative considerations offer a hint for developing well-engineered designs. If there is no heat flow in the direction, there will be no thermal stress. Hence, added measures to decrease the heat flow is one possibility.

Ceramic materials have much greater capacity than metals in strength and, usually, the brittle component of a thermal stress is critical. Particularly, the unopposed tensile stress in the outer film of cylindrical liners is troublesome.

• Stress support. Reducing or external support to contract the tensile stress offers another engineering possibility. In this connection it is to be noted that ceramic can deform very little without fracturing. There can be little adjustment of stressors by deformation in the ceramic, and any support or preloading must be applied in a uniform and isotropic manner in order to prevent cracking. However, some of the support is inadequate to prevent cracking, it might retain the parts so that the ceramic being would remain effective.

• Stress reduction. Still another engineering design possibility has to do with use. Such measures as decreasing the wall thickness of cylindrical liners, as splitting them longitudinally, are alter-

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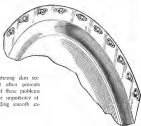
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Fastener Problem of the Month

JUNE, 1951

PROBLEM: Fastener does not flow to aircraft skin because problem. One of these problems is created by the impedance of fastener to providing smooth external surface.



SOLUTION: To meet the assembly requirement ESNA has captured two similar ribs with deeply contoured bases which fit over the normal dimensions formed in the skin surface by fastening. ESNA types A31 and 1797 are both manufactured with a 100% contour, the diameter of the contour in the 1797 being slightly larger than that in the A31 in order to accommodate contour variations in practice in aircraft tooling.



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ESNA TYPE A31



ESNA TYPE 1797

in replacing critical thermal stress. Any size reduction or contour compensation should be helpful.

► **Proven Practices**—The importance of sound engineering has been indicated in the service tests to date. Foremost is the use of cast ceramic backing material in the areas between a fastener and the structure between a fastener and the motor housing. Real progress began with such assemblies.

► **Ceramic backing.** The backings developed by Ertleco are lightweight refractory concretes or plaster mixes which are dimensionally stable at most severe positive spin testing and cooling. They provide, at least, a stress support and, probably, some desirable padding. For this reason, they transmit suddenly the gas pressure load to the housing, as well as creating critical thermal stress. Also, they reduce the heat flow through the lining.

► **Chamber lining.** Another design which was indicated in service tests used a combustion-chamber lining of steel, tile-like segments. The complications in fabrication and assembly made this design less attractive than the use of the backing material with a one-piece lining.

► **Metal shells.** Laboratory tests have shown that ceramic metal shells on the outside of ceramic linings reduce thermal cracking. These shells have been applied by both electroplating and flame spraying. A shaded further improvement was achieved by shoving a steel dense onto the alternate metal shells.

► **Lining Cores**—No service test lines made yet of specific materials, cost or weight. These three factors are, of course, all closely related and can be weighed on criteria established in service tests. Neither engineering nor material tests have yet been established from service tests in any single instance, detailed consideration of these factors is not yet possible.

However, some general comments might be made. On the basis of the estimated lining temperatures in service tests to date, through proper engineering, many concerns, design refinements appear in distinct possibilities for the future. Earlier estimates of the temperatures apparently were high. Also, certainly the proper fabrication would make a backed ceramic-lined motor much cheaper than a comparable or generatively cooled motor.

The only wholly material failure yet observed in service tests has been radial cracks. This has been attributed to shearing by the spraying gas, solely, or to corrosion attack followed by such shearing. There is little or no indication that such cracking initiated the corner holes in tests to date. If the corner is punch machined, the ceramic in early cases can be made stronger by such well known practices as the use of



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five gained new material or higher operating temperatures.

Material developments—Two of Bartelle's developments in using materials are particularly interesting, and should be mentioned. One is a special plaster mix which appears quite suitable for large carbide dies of standard, single-use nature.

The material is inexpensive and can be easily fabricated, by casting it in place in the bearing. Upon firing the motor, the plaster decomposes and stands heat in the process. As a result, the bearing is kept quite cool. We doubt whether such things would withstand erosion in the second section.

The other development has to do with graphite. This material has several attractive properties. It probably cannot be treated by thermal stress, just because of its high thermal conductivity. Also, it has an extremely high melting point and low specific gravity, and, unlike most ceramics, is easily machined. However, it conducts at relatively low temperatures and is not very resistant to erosion.

Both of these materials have been considered sufficiently by a satisfactory glass for high-temperature performance in a motor using in limited service tests. A backing material should be used with graphite to prevent eroding the motor shell, and to prevent mechanical cracking from the gas pressure load, even though thermal cracking is no problem.

The ability of ceramic linings has been demonstrated on the test stand. Such assemblies are not readily available to theoretical treatment, but their limitations and performance can be established by tests observations in service tests. These limitations are recognized by design as well as the material, and it might be inferred that sound engineering results are still in unproved materials. At present, no bounds are seen to such improvements.

On many cases, the idea and developments discussed here are not those of the authors. Many modifications in the problems in associated motor have come from Lt. Col. B. A. Jones and Mr. R. W. McClure of the Sperry Gyro, The Power Plant Laboratory, Wright-Patterson AFB, and from Messrs. J. A. Byth and J. F. Lewis of the Bartelle staff.

Detects Faults Aloft

An enhance ac electrical system fault analyzer has been developed by A. V. Rice Controls Ltd., A. C. Chinnery for the company's Jetway.

The analyzer's housing includes a control panel of warning lights or indicators actuated by relays connected to show up faults reaching them over voltage, voltage failure or overload, together with the location of the condition.

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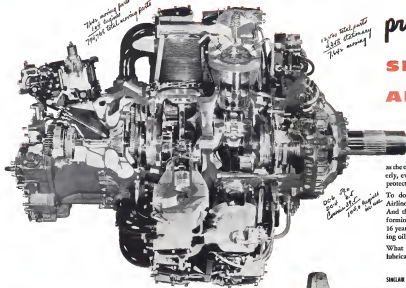


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PRODUCTION

Tax Hazards of Plant Expansion

Government experts industry to finance greatest part of new facilities, but under almost impossible terms.

By Russell Mottley

To build airplanes, three things are needed: facilities, materials and man. Facilities are the starting point—land for buildings, buildings for machinery, machinery for the materials and man.

It may seem easy to get enough facilities quickly. Today there is a glut of unused space in the aircraft industry (not just land and buildings, despite the fact that the airplane looks fairly good and it is better than it was in 1946, when total fleet space was less than 10 million sq ft).

Adding about 60 million sq ft of floor space today for the major aircraft manufacturers (including plant assets) and a peak output of 7 1/2 sq ft per year, we could produce about 500 million airplane pounds, including spares, a year. This is more than ten times the 1950 production, and about one-half of the 1944 peak production.

Facilities Financing—But today's airplanes call for two new types of machinery and facilities. And the industry has discovered that financing the latter is a great deal different, and fought with for more years, than was the case in World War II. At that time, the government financed most of the facilities expansion. This time, it expects the industry to do its best on almost impossible terms.

Total aircraft facilities expansion from 1940 to 1945 cost the staggering total of \$1,234 million. Of this, \$420 million, or 34 percent, was privately financed. The rest was paid by the federal government.

Of the total privately financed investment, 664 projects costing \$135 million in 1940 and 1941 were certified for tax amortization. Under a 1941 amendment to the Second Revenue Code of 1940, contractors were allowed to amortize facilities certified in accordance with the war effort over a five-year period or over the duration of the emergency—whichever was to be less.

Most of the funds for the privately financed expansion came from current earnings and current credits to depreciation reserves.

The Picture Now—Today, the picture is very different.

Most importantly, the government, up to now, has tried to place almost the whole job of facility expansion upon in-

The drive to increase the aircraft industry's facilities has created problems which have been first publicized because of the tax treatment in one article, of which this is the first. The author, a frequent contributor to Aviation Week, is consultant to the Aircraft Industries Assn.

dustry. This is very different from the wartime practice, when industry applied only 10 to 15 percent of the funds.

This is brought out clearly in a memorandum by the Defense Production Administration of May 1, 1951, which states: "The new capacity and expansion of facilities can be built and financed directly by the government if it can be done . . . by private business . . .

In the present emergency, the choice has already been made that in the maximum extent possible the expansion of our industrial plant . . . shall be carried out by the private means . . .

And, in trying to bring up such a matter, manufacturers expect a greater percentage of the value of new plants erected than in World War II. Charles Wilson, Director of Defense Production, is quoted in the New York Times as saying: "It has been found that World War II the government still built war plants and turned them over to private industry to operate. Therefore, there was less need for tax relief than there is now when private industry is building the plants itself, and the government is contributing very low."

To reduce the industry to just its own resources, the government can do so by amortization attractions (deducted after those that existed in World War II, but had long stopped in September, 1945).

Section 126A of the Internal Revenue Code was included as a part of the Revenue Act of 1951 so as to make available in the present emergency a similar means of encouraging the investment of private capital in the expansion of facilities.

The Differences—There are, however, several important differences between Section 124 of World War II and the present Section 126A.

First, in determining the cost of

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3000-ton metal stretch press, produced in steel for all aircraft requirements and capable of stretching from 46 to 232 tons, are reducing production costs and setting time and labor economy.

the emergency facility there is now available only "for defense purposes" as is attributable to defense purposes.

The owner is entitled to the deduction of only that portion of the investment which the certifying authority allows him to retain in his gross income, less five, during the emergency period. (Naturally, this privilege can be used only if there is an income and thereby for that purpose.) The certifying authority is directed to certify only as much of the investment as it (a) is attributable to defense purposes and (b) that just necessary during the emergency period.

Up to Apr. 15, Certificates of Necessity, which are required for accelerated depreciation, had been issued to the aircraft industry not for the full 100 percent of the cost, but for an average of 65.2 percent. While several foreign air obtained certificates for 58 percent, and like an average for 90 percent, a small-sized aircraft only 30 percent, and a building for the manufacture of guided missiles "in locations supporting essential post-emergency utility" only 35 percent.

While the aircraft industry's average eligibility has been 65.2 percent, the overall industry average is 60.1 percent, that for the steel industry is 75.2 percent, coal, coke and iron ore, 52.4, and automotive equipment, 51.1 percent.

What this actually means is that 51 percent of the automotive equipment industry's expenditure for equipment is attributable to defense purposes. Yet that industry can expect full and constant post-emergency use of those facilities. The aircraft industry may expect only negligible post-emergency use of its added facilities.

► 5-Year Emergency—A second important difference in the present Section 124A is that the term "emergency period" is considered to mean five years. If the emergency should last less than 5 years, the amortization can not be applied during this shorter period. Under the old Section 124 the owner had a chance to get relief by writing off the entire remaining cost of the facility during the emergency if that period was less than 5 years.

The profits arising upon which the government now places such heavy emphasis means that the manufacturer get up the money himself. The availability of funds from the limited resources of the aircraft industry will depend upon the tax and amortizing treatment of the costs of these facilities.

The low percentage granted for aircraft may well be an insufficient incentive for investment in emergency facilities of little post-emergency use.

The War Relocation Authority for accelerated depreciation for 5 years or for the duration of the emergency



save time... speed production on the Northrop F-89

Here's the U.S. Air Force's new Scorpion F-89 all-weather fighter now rolling off the production line at Northrop Aircraft, Inc., Hawthorne, California. Combining speed, speed and punch with "noisy eyes," the Scorpion is the jet-propelled successor to the famous World War II Black Widow.

Note the jet-like control surfaces at the outer end of the wing's leading edge. These are Northrop's latest development—"Decelerons." Combining the functions of ailerons, fighter brakes and landing flaps, Decelerons pack extra maneuverability and weight-lifting ability into the razor-winged, twin-jet fighter.

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fabrication of these Decelerons. Like many other aircraft manufacturers, Northrop Aircraft, Inc. has found Cherry Rivets make their hard jobs easy.

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Cherry Rivets are ideal for double-surface structures, box sections, tubes, flats and other "hard-to-get-to" spots. They spend assembly — use man hours... lower unit costs. If you're not familiar with Cherry Rivets and their time-saving potentials, take a moment now to write for full information.



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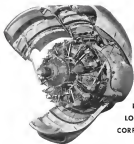
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provided a much greater incentive to invest in emergency facilities than does the present provision which does not protect the manufacturer as well as the company should and sooner. Better experience has taught the aircraft industry that it is likely to experience heavy losses in spite of the emergency demand in mind. Lack of ability to write off the staggering cost of these investments over the emergency period would increase the burden in the post-emergency period when the industry can least afford it.

► **Tax Incentive**—In a statement on Apr. 23, 1951, the Defense Department held that there is tax exemption or accelerated depreciation given mainly to performance based items. Items will be favored because of higher depreciation cost allowed during the early years of the life of a facility. They will be correspondingly lighter in the later years of its life when the cost of the facility has been written off.

Any tax saving to a company during the emergency amounts to a deferred tax which will be received by the U. S. Treasury after the emergency period. Whether there will be any money saved or lost in the long run depends upon the tax rates after the emergency and the profit and loss position of the company after the emergency.

Accelerated depreciation for ten per-

cent is, therefore, not a subsidy or a gift but rather a tax incentive to take a risk which is beyond the normal. Just how real this incentive is depends on a good deal on the post-emergency demand for the product. If there is good reason to expect a heavy demand and a lower tax rate, then there is a real tax incentive.

► **Insurance**—The same statement of the Defense Department held that the real incentive provided by the accelerated program is not the tax incentive but the pricing incentive. It holds that the contractor may receive the full amount covered by the Certificate of Necessity by adding one-fifth of this amount during each of the 5 years of accelerated amortization to the price of the products of the facility. Likewise, it points, the contractor will receive less than the amount entitled to the Certificate of Necessity.

The statement continues "that a contractor cannot afford to invest his funds in emergency facilities under Certificate of Necessity if there is a great risk that the facilities will not have a post-emergency use, unless he is given allowance of full amortization as pending during the emergency period. Unfortunately, in spite of our stand-

of the Defense Department, aircraft manufacturers are not allowed to include any accelerated depreciation on their costs. This means that if the emergency should hit as we say, that three years, a manufacturer who has produced a machine that is usable only for emergency production will be allowed to write off only 50 percent of the cost of his machine as his gross if his "normal" depreciation period is ten years. If there is no use for the machine at the end of the emergency, there is no way for the manufacturer to get the remaining 70 percent of investment back.

► **What Is Needed**—The 5-year amortization is of some help to industries which may expect a continued demand after the emergency. But for the aircraft industry, it is not an adequate answer to the problem of providing additional facilities. Here is what is needed:

► The cost of privately financed facility expansion should be allowed to be written off either during the period of the emergency or over a period of five years, whichever is shorter.

► Purchase of non-aerautical equipment should be allowed to include in their price the cost of the facilities entitled for accelerated depreciation.

(Near work. Write new facilities are needed.)

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Fasteners Checked In Factory Tests

Self-locking nut samples are being factory-purchased for high and low temperature and vibration chamber tests.

The Eltric Shop Nut Corp. of Anacostia is being a lot of fasteners after a vendor test at Wright Patterson AF Base to evaluate the performance of its fasteners under extreme conditions. And the rig permits the company to determine whether self-locking nuts under development can ultimately pass existing or proposed A-N test specifications.

The installation affords accurate control of temperature from -75 to 1,300°F to accommodate the fiber and Nylon-matrix nuts and internal fasteners for the range in which they would generally function.

The rig incorporates a computerized hammer mechanism that produces the required vibrations. The testing stage carrying the nuts is located below the hammer, with the other's free end positioned in the oven section. During the test an air jet is conducted over cooling fins on the rotor to dissipate the heat before it reaches the device under test. During the run, the rotor may be re-

vised for determination of stretched loading at solution of the nuts.

For low temperature tests a special chamber is inserted around the test rotor and cooled with dry ice.

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USAF is using pattern art to speed up the Air Force portion of obtaining approximately 3 million items at the Federal Catalog Supply System.

Under the FCS, each item of supply—nut, screw, or coil—has a part number, stock, stored, or applied by the government, will be identified only one name and description, assigned only one federal identification number, and classified under a uniform commodity classification. Object is to establish a common supply language for use by more than 60 different military and civilian supply agencies in the government.

The drawings will simplify characteristics and descriptions of items, and can also be used for selecting a standard issue for an item that may be sold under a number of trade names.

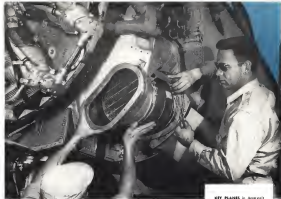
PRODUCTION BRIEFING

► **Boeck Aircraft Corp.**, Wichita, is setting up a production program on its Twin Otter light transport to build 100 of the planes by the end of 1957. The company now has an order enough orders with deposits to cover the output.

► **Boeing Aircraft Co.**, Seattle, is calling for 1000 additional engineers to join its present staff of 2800. About 600 of the newcomers will go into the engineering division, with some 250 recruited by Boeing and a few more by Flight Facilities. Meanwhile, Boeing-Wichita wants 150 more engineers to add to its present staff of 714.

► **Carlini-Weight Corp.**, is negotiating to purchase land, buildings, trade names and other assets of Columbia Protectors Co., Columbia, N. J., plastic products maker. Main plant of Columbia contains 100,000 sq. ft. and includes 10 acres of land. A smaller building has 25,000 sq. ft. C-W plans to combine present plastic operations and will also move its new Electronics division from Caldwell to the site.

► **Glenn L. Martin Co.**, Baltimore, is building expansion trailers for heavy anti-aircraft gun fire control systems. The computing systems are being built by Bell Telephone Laboratories for Army Ordnance. The trailers can be air-transported and are lightweight so they can be towed across water obstacles.



KEY PLANE in new military pilot training program are North American Aviation's T-28A Trainers. Equipped with Wright oil-cooled engines having a maximum horsepower of 800, the planes are equipped with Clifford Feather-Weight Oil Coolers.

NORTH AMERICAN AVIATION'S T-28A TRAINERS

Cool Their Oil With Feather-Weights



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HYDRAULICALLY-FORMED FELLOWS
AND BELLOW ASSEMBLIES



Constant Speed for Airborne Generators

Device gives uniform alternate rpm., despite engine vibrations.

By George L. Christian

Rocked, 18-11 will soon be possible for jet engine manufacturers in terms of engines closely equipped with an accessory drive shaft which will operate at a constant speed regardless of engine rpm., according to P. A. Anderson, manager, Avionics Division, Bend/Synair Machine Tool Co.

These constant speed pads are a result of the incorporation into the rotor of a carbide type hydraulic constant speed drive. This represents a further development of the constant speed alternator drive currently used on the B-36 and F-51 airplanes.

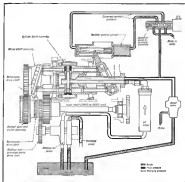
The use of constant speed drives to prevent air and die generators assumes increasing importance as the use of rotor and other avionic gear grows. Greater employment of ac power and variable speeds are possible.

► **Lighter and Simpler**—The new development, in addition, promises to save space—constant speed work of pilot design. The elimination of inverter and oil cooler, needed for separate unit installation, saves still more space. This is because the integrally built drive uses engine oil instead of having its own supply.

Basic specifications of the drive are: Constant output speed is maintained over ground from three-to-one speed speed range approximately 1,600 to 5,000 rpm (1-10 speed cases greater speed ranges are available, frequency is held plus or minus two cycles under steady-state conditions, rated power output is 60 hp. which, considering power factors, is equivalent to approximately 35 hp. The unit provides for the rated overload condition—50 percent for five minutes, and 200 percent for five seconds. An individually mounted governor is used to control speed.

► **Reverse Control**—In certain aircraft configurations an alternate type of constant speed drive may be used to advantage. One interesting development currently under consideration is that certain special requirements in a "to-wait system" in which the accessories drive is located inboard from the engine. This system provides them additional advantages.

► **Reverse location of the drive supply**



MUNDYGRAND'S engine-driven, hydraulic, constant speed alternator drive. Department of the West is controlled by position of the wobble yoke.



FRAZER-HAMILTON MANUFACTURED shafted product. Input shaft is at lower right, alternator mounts on the left.

allow engine manufacturers to provide only one power take off on the engine proper. The present tight and efficient coupling configurations. Improvements should accessories may be provided and conveniently located where they do not interfere with engine cooling and are made readily accessible for maintenance.

► **Constant speed of the accessory drive**—Use of a smaller rotor system hydraulic pump since the pump will be turning at relatively high speeds even with low engine rpm.

► **Alternate can be used as a starter**, possibly eliminating a heavy and bulky accessory. The constant speed drive, with a simple control, can be put in "neutral" while the alternator is starting synchronous speed (where properly designed alternators can provide excellent torque characteristics). When in speed, the drive can be gradually "clutched in" to transmit the alternator torque through the hydraulic system to the engine for starting.

► **Close starting of multiple jet engine aircraft**—A number of such engine mounts a hydraulic unit. One engine is started with an outside power source, then the hydraulic power developed by the first engine is used to start the remaining engines. Firing up a stalled engine as light if windmilling should fail to do the job is possible.

► **Father and Son**—Father of the remote drive is a Bend/Synair-developed and developed unit called a "Constant Speed Hydraulic Accessory Drive." Standard equipment on all B-36 alternator drives, four per aircraft, the unit gives remarkable constancy in output speed. Dual installations are also being made on the Martin F5M-1.

These constant speed drives, mounted adjacent to the engines, have an output of 40 kw., equivalent to 50 hp. At steady rpm., vibration is on a level of 1 percent. Maximum deviation under transient speed conditions is less than 4 percent. Two, three or five alternators can be operated in parallel and will divide load. Operational period exceeds 1,000 hours, but some units have exceeded 1,000 without overhaul.

► **Fixed Problems**—A problem in the development of the drive was the hydraulic fluid used.

Used initially AN-D-66 was used in the drive. But this fluid tended to break down at velocity, creating a oil change every 60 hours. The fluid also had relatively poor foam breaking characteristics which required operation.

Dr. M. B. Foster, Director of the Petroleum Research Laboratory, School of Chemistry and Physics, The Pennsylvania State College, in cooperation with the Materials Laboratory, Air Materiel Command, developed a synthetic hydraulic fluid, normally a mixture of special dibase and bases.

The new fluid has excellent foam



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PIERCE

breaking characteristics and shorter its life. Lubricity is equal to or better than AN-D306 and it has a higher flash point. Viscosity index is somewhat lower but acceptable. Great advantage of the synthetic fluid is that it will last the entire 750 hours overhaul period without breaking down or requiring replacement.

General studies are being made covering the use of hydraulic in the drive. Preliminary results indicate successful performance.

► **How It Works**—The constant speed accessory drive consists essentially of a camshaft fixed displacement, piston type hydraulic motor and a variable displacement pump closely coupled as a rotating epicyclic block.

The pump output is determined by a wobble controlled by a governor through a control cylinder. With the wobble in one static position, no fluid is pumped except a slight flow due to leakage losses; therefore energy transfer from input to output shaft is essentially mechanical. Any variation in engine speed is immediately sensed by the governor which, through the control cylinder, changes the position of the wobble to vary the pump output to drive the motor at a constant speed, within the limits of the machine. A make-up pump supplies oil to the tank through a float. Oil tank and cooler are remote

located in the engine.

Secondary, which assisted in the aircraft hydraulic systems in 1946, is now in quantity production of the developed constant speed drive and a new pump for large scale production of the remote system and the integrally built constant speed drive.



Pan Am Beats a Bushing Problem

Worn poppet governor bushings are being quickly and inexpensively re-

placed by Pan American World Airways at its Miami Overhaul Base.

When the governor manufacturer, Hamilton Standard, told PAA that it would be cheaper to buy new governor bodies for \$77 each than to rebuild old, worn ones which entailed engine operation, H. J. Trudell, a PanAm master mechanic, devised a simple repair guide and a procedure for bushing the idle gear and drive shaft gear bushings. Cost of manufacturing the tools was \$26. The operation takes half an hour and total cost of the new bushings is \$6.71.

The company says that 19 governors have been revitalized by Trudell's method and are "working out satisfactorily in service." It adds that at least one large domestic airline has adopted the bushing replacement technique.

Low-Cost Computer For Small Business

An electronic analog computer the size of a desk drawer file cabinet has been developed by the Computer Corporation of America. This new computer, named Ide for *Ideology-Differential Analysis*, is being sold for less than \$5,000 on a 90 day delivery schedule.

It can solve up to eight side-by-side differential equations with con-

stant coefficients. Eight initial conditions may be set into the machine.

With auxiliary equipment, Ide's range can be extended to solving equations of higher than eighth order, in addition to differential equations with non-constant coefficients and one, linear differential equation.

Solutions are recorded in graphic form on a two-channel oscilloscope. All computed quantities can be recorded, two at a time. And any computed quantity can be stored on an oscilloscope while being recorded.

Raymond Bowersox, vice president and sales manager of the computer firm, said that the low cost of Ide will make it possible for small businesses and research facilities to acquire an analog computer with all the time and labor-saving possibilities that go along with it.

The use of patchboards, common in the larger computers, has been eliminated. Problems are prepared on a set-up board which, when in place in the machine, automatically makes all the necessary electrical connections.

Problems can be changed as fast as the time required to slide out one set-up board and slide in another. And the boards can be stored for future use.

Only two control knobs apply the forcing functions and start and stop the computing process. All 20 operations are identical plug-in units.



DRESSED FOR A QUICK EXIT

When it's time to leave that plane is a breeze at 40,000 ft. Five jet pilots now don't have to wait previous minutes fumbling themselves of various levers and wires before triggering the ejection seat. An Heister Command has developed a quick

document (right) that automatically separates from the plane with the pilot, permitting him to concentrate on doing just one thing—operating that seat ejection lever.



High signs for 89's

Northrop is a good place to work... good people work at Northrop! The fine morale and high caliber of Northrop personnel have been responsible for many production feats in the company's history.

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At Canadair, more than 40,000 skilled employees are currently building some of the world's finest jet airplanes — the F-86 Sabre jet — in the air over Korea. From drafting tables, to machine shops, to assembly lines and to final test approaches, the spirit of speed, they work for the cause of freedom.

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Circle 20-21

NEW AVIATION PRODUCTS



High-Output Plane Refueling Truck

New, fast-loading refueling trucks, capable of carrying 5,000 gal. of high-output gasoline and loading it at 400 gpm, have been put into service by East Stouffville Oil Co.

Two of the trucks already are servicing United Air Lines' planes at La Guardia Field, while others are scheduled for operation at airports in New England, line reports.

A major feature of the new model is that fuel is delivered by means of a single centrifugal pump which is driven hydraulically—controlled by a separate gasoline engine now constantly used. Power for the pump, located in the cab area at the rear of the tank, is from the same source that pulls the fuel, a Ford "F60" tractor engine—through the transmission and a power take-off unit. Advantages of this arrangement is fuel save there.

- Clean, low congested piping arrangement.
- Reinforced tie bars.

• Lava incrustation from those generated by gasoline engines.

The improvement in output to 400 gpm is credited to use of a larger, more efficient pump and a modification of the piping system. The higher delivery rate is obtained without an increase in working pressure. This says Canadair is fed to the plane through two 50-ft lengths of 2-in. hose containing separate nozzles which can be opened simultaneously. When the pump is running at 1,750 rpm, fuel is supplied at the rate of 150 gpm at each nozzle, whether operated singly or together.

Canadair in the rear pumping circuit is further reduced since there are no hose coils crowding space. Hoses are kept the wide gridded deck of the trailer. From the convenient perch, operators can work via a short ladder to the plane wing.

Fuel in the tanker is carried in low expansion containers, each equipped with a self-operated emergency outlet.

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Speedy Seal for Du-Valve

Maxima V-Band Couplings provide tight pressure seal on engine work at 3000 rpm on Curtiss 5-360 jet engine. These applications in the bomber's turbo-supercharger, fuel control, and other systems are typical of many Du-Valve jet engine applications. Coupling is made of high strength, low maintenance material and is easy to install and maintain.

Circle 10 on Reader Service



ENGINEERS' NOTEBOOK



Jet Engine Couplings

Maxima V-Band Couplings eliminate the need for expensive and unreliable jet engine couplings. The V-Band Coupling is made of high strength, low maintenance material and is easy to install and maintain.

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which can be manually dented off by the operator from the top deck or the ground to stop the flow of gas from the tank to the pump in an emergency.

Filters in the system are remote and designed to screen out particles larger than 10 microns. While they are not designed as water separators, they actually function in this capacity since fuel passes through them slowly because of their large size, strain Easo Standard D6.

The semi-trailer trailer weighs about 55,000 lb, fully loaded. All sides are provided with the latest type ball air brake equipment. The vehicle is designed for reversing loading, but also can be quickly converted to ordinary loading. Easo says.

Insulating Tubing

Fiberglass "C" protective insulation for electrical wiring in aircraft is designed to stand up to "severe service" conditions encountered in military planes. It is being produced by Resinflex Corp., Billerica, N. J.

The tubing is a flexible, non-flammable type, engineered to perform in the humid atmosphere of high altitude or in heated atmosphere around jet engines.

According to Resinflex Corp., it retains good dielectric properties and high tensile strength while subjected continuously to temperatures ranging from -150 to 575°F. The transparent tubing reportedly is already in use in some aircraft.

Fiberglass "C" is said to be unaffected by concentrated acids, alkalis, gasoline, oil, water, high humidity or tropical exposure. It is made to order in sizes up to 1/2 in. dia.

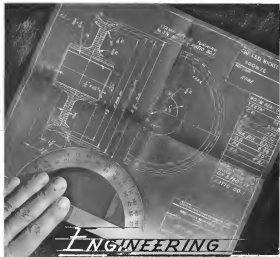
Joint Sealer

"Lock Lock," a pasting compound designed to prevent leakage of jet engine leaks is being marketed by Highvite Chemical Co.

Tests by one of the largest aircraft engine manufacturers in the country have shown the new compound to be "highly successful" in preventing leakage of jet fuels at high temperatures, says the company.

And it does this without freezing the joint tight, it adds.

The new compound has been difficult to prevent leakage of jet fuels at 1500 and 2000 deg. joints with a non-hardening compound because of the pressure of stresses, vibrations and other peculiar conditions. Tests were particularly troublesome when jet fuels were handled at high temperatures on engine and converter hot starts, it says. Highvite Chemical Co.'s address is 10 Collins Ave., Clifton, N. J.



ENGINEERING

of this 100% is the art and science which converts your design into drawings and specifications of component parts. Here... in our own plant... our own engineers determine mechanical and metallurgical structures. Our own draftsmen create the intricate, accurate drawings from which other skilled hands make the finished parts.

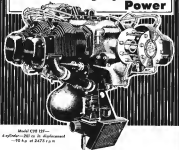
- Engineering is important. It's a primary step in the 100% method of complete manufacturing control. It covers you at every step which will perform satisfactorily... when used in your shop or as equipment you sell to others.
- This engineering service we give our customers is another reason why we can say—"No one shares our responsibility."

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MUSKOGEE, MICHIGAN

Protective Coat

Laminate additions to the line of plastic veneer coatings for aircraft is Seal-Fin, produced by Doidl Chemical Corp., Little Ferry, N. J.

This product is a clear plastic deposited to prevent corrosion and to protect against corrosion and weather. An application by spraying leaves a thin, clear film which adds alone to the finish and prevents penetration of dirt or water. According to the distributor, Van Dusen Aircraft Supplies, a single application can be expected to last several years. Claiming of surface is expected when Seal-Fin is used. Van Dusen says, some glass and flat-surfaced materials like wood.

The product was developed by Dr. Thomas N. Doidl, Jr., after three years of experimentation and light testing. Doidl also produces Seal-Fin Degreasing Solvent and Seal-Fin Remover and Thinner. Products are available from Van Dusen Aircraft Supplies, Eastern Division, Inc., Teterboro Air Terminal, Teterboro, N. J.

ALSO ON THE MARKET

"Nassar" wire boxes are designed to permit faster and more efficient supply of suspended parts to production-line workers. They require only one such as mesh space in series of engine or when loaded—10 units can be stored in a 4-ft stack. By means of an adapter, they will store links, wires or sockets, when hung from special suspension. Made by Charles Wilcox Designing Mfg. Co., Romayne, Ohio.

"Flex" hand cutlender heretofore took 14 or 15 strokes to cut a 12 to 15 ft stream by pulling just at top of one. Made by Bostwick Laboratories, Inc., Roslertown 3, Conn.

Michaux tool holder gets the job on tool lists, preventing lost tooling, saving time, preventing lost time and repair cost. One grip one extra equal pressure. One 100 length of ball, right up to cutting edge. Unlike accessories, various uses and shapes of bits, it available in both standard 15-amp channels and with special channels. Made by Robert W. Clarks Co., 1910, Santa Monica Blvd., Beverly Hills, Calif.

"Belo-Gel" paper-backed, pressure-sensitive tape can be used to stick for spray or brush painting and staining, packaging, sealing of damaged surfaces, for building loose joints in assembly, labeling and dust surface protection. Made by Belo-Mechanical Co., division of Natus Co., Troy, N. Y.

FINANCIAL

Industry Goes to Banks, Not Public

Little equity financing likely to be undertaken because private loans result in considerable tax advantage.

Limited public and private financing has attended the aircraft industry's current production activities this year. As a fuller impact of the armament program is felt, more capital funds will be required by the aircraft builders.

The line projected sale of 135,000 shares of new common stock by Northrup Aircraft, Inc., highlights the lack of securities used for equity money. This is the only equity financing that is being attempted since World War II by any aircraft manufacturer. Such relatively limited financing that is being accomplished by the rest of the industry is confined to short-term loans.

At present market prices, Northrup hopes to raise a gross of around \$1,776,000 (a net of about \$3,500,000) as a result of its new financing. Only a few months ago, the company arranged a \$50 million revolving bank credit for two years. While the extent of such bank coverage is not now known, it is believed that part of the credit was used to reduce the Reconstruction Finance Corp. loan previously advanced. On Apr. 21, 1950, RFC granted Northrup a total credit of \$4,000,000. As of March 31, 1950, \$5,725,000 was due RFC, with the amount advanced to around \$3 million at present.

With the rapid stream of new aircraft builders adequate for their own financing, long-term construction financing that any additional applicant equity financing may be attempted by the group in the period immediately ahead.

Private financing—that is, loans to finance the aircraft industry will require substantial additional funds to finance the accelerated flow of production projected for later this year and during next year construction during 1952. This need will be largely met by short-term bank or insurance loans. The pattern has begun to take shape and will need likely include substantial amounts in the near future.

The creation of debt is far more desirable in present than the issuance of new equity securities. Interest on loans is tax deductible, dividends are not, a company's needed capital base is advanced for more profit for its purpose, the short-term debt being created is largely of a self-liquidating nature and provides the necessary flexibility in ex-

plaining the industry's financial requirements. Equity financing, however, present characteristics are, say, during a period of contraction, leave a too burdensome capital structure, amenable of support by a more "normal" investing level of loans.

Conversely, the larger short-term credits arranged recently was one for \$50 million for Consolidated Vultee Aircraft Corp. Of this amount, \$10 million was applied to being drawn down, with the balance being made available by the ten participating banks during the two-year period of the credit.

This credit was slightly unusual in that it has a floating interest rate. The current rate is 11 percent or 10 percent above the present commercial rate established by the Chase National Bank 90-day certificate. In no event, however, on the interest rate would it be placed annually. This current credit replaced a previous two-year agreement which limited borrowings to only \$20 million.

•CAC United Aircraft Corp. has established a line of bank credit. Since the end of 1949, the company has built in a likely that such borrowings will be increased substantially in the year previous.

•Boeing Aircraft, as recently as Feb. 17, 1951, arranged a \$100-million credit with a maximum of \$20 million at only 5 percent. This replaced a previous loan of \$5 million registered last fall.

•Martin, The Glenn E. Martin Co. probably increased its borrowings to handle its increasing production requirements. The company recently borrowed an additional \$4,610,000 from RFC and the Mellon National Bank on a percent interest basis. This increased Martin's loans to a total of \$11,017,181. Of the amount, RFC supplied \$10,597,341 and the Mellon bank the balance.

•Bell-Flatten the rest Bell Aircraft arranged the placement with an issue size company of \$1,809,000 in retail bonds. These funds are to be applied toward the construction of the company's 57-cylinder helicopter manufacturing plant at Fort Worth.

•Republic. Late last year, Republic Aviation Corp. established a \$5 million line of bank credit. No borrowings

have as yet been reported by Republic under this credit.

Reliable sources indicate the other major aircraft builders have been making progress as to the establishment of bank loans credit before the year is over, it is probable that most of the present aircraft manufacturers will have arranged for various bank accommodations to handle their increasing production requirements. Unlike the earlier borrowings, however, the forthcoming debt will be faced with rather a more exact on their loans. In any event, this cost will be absorbed in part of the production expansion.

•Pitman-Pitman-Continental today did its share to loan those purchasing prior to and during the earlier years of World War II. These common stocks are secured by the sale of production in asset securities.

The record shows that from 1935 through 1946 every aircraft company holding a equity interest was able to obtain additional equity capital through public financing. This was done by selling packaged and common stock at market conditions obtained. This was highly flexible as the group had wide publicity appeal as a "growth" industry with a high rate of return. The record showed this new financing was adequate to meet working capital requirements and cover immediate loans. As long as favorable market prospects prevailed, there was little difficulty on the part of any of the companies to successfully accomplish public financing.

It is interesting to observe the tremendous volume of sales that were handled on a relatively small amount of equity capital. For example, the sales of more than \$82 billion billed in 1944 were financed with an average equity investment of only \$420 million. This condition made for considerable leverage in earnings on an investment in a phenomenon which runs once again support with increasing aircraft debt levels.

During World War II, V-loans were extensively used to finance activity that while useful, but not identical, legislation has again been enacted to make such type loans possible, not a single aircraft manufacturer has evolved this type financing, government sponsored financing device.

The new V-loans provision are believed to be giving participating banks the necessary protection. From possible expansion of earnings or capital from the issuing company. Moreover, in the present loans to the industry appear adequately insured by production contracts. They are desirable alternatives, and their issuance will tend to eliminate the need of the interest return on a government guarantee that is not really needed to those as stated.

—Selig, Abbeled



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AIR TRANSPORT



LOOKING FORWARD in the CAB, you see the passengers looking backward. When not in use, the seats are folded flat, as shown, into an open-air walk.

MATS Adopts Rearward Seating

Decision to use backward-facing arrangement in all new transport types may affect airline study of plan.

By Thomas M. Sell

Rearward-facing seats on transports, a subject which has been discussed here and abroad for five years or more with little subsequent action got a real solid boost with announcement by the Military Air Transport Service that all future transport types it orders will be equipped with seats facing the rear.

MATS named members of the Aviation Witness Team to their annual convention in New York in the last Boeing C-97 to be fitted with passenger rearward-facing seats, and disclosed that 20 more C-97s will be similarly outfitted.

Lockheed Aircraft Service, Inc., Burbank, is modifying the lower structure and installing floor straps for the C-97s.

The special MATS C-97 is equipped with 36 pairs of double folding seats in two rows on the main deck. Seats are made by the Beach Aircraft Corp., Wallata, as designs of the Aero

Medical Laboratory of the Air Materiel Command. They will withstand a 10G load without tilting.

When not in use the seats may be stowed and quickly folded against the cabin walls to provide aisle space. Manufacturers and shops and other equipment for converting the C-97 into a lift-carrying transport hold steady out of the way against the tops and side of the cabin when seats are installed.

Seating Comfort-Air Inc., the Beach seat manufacturer, says the seats are at least extremely satisfactory in construction. They have only an auto-belt, foam rubber cushions over contoured steel and back pads, and arm rests, and another seat pad at the back of the head. But they actually give greater comfort and less fatigue than the deep cushions used on commercial airliners. This is borne out by passenger experiments as well as Aero-Medical studies. The seats recline, and with two pillows, one at the small of the back and another

at the neck, are comfortable in a crash.

An advantage is weight saving. In comparison, 5 lb. per seat can be cut out by substituting the seat pads. Pillows and blankets can be obtained. Primary object of the seats, of course, is safety. In forward-facing seats, the entire back, neck, and head, and parts of the arm and legs absorb the shock deceleration. This may mean the difference between a minor and major injury, or even between life and death.

Recent laboratory tests have shown the human body capable of sustaining the inert periods over 40G deceleration without injury, provided the head is properly distributed over the body.

Despite the rearward-facing seats are not new. They have been standard on several British and Australian airlines for some time. Recently, Australia announced that all commercial carriers in that country would be converted to rearward-facing seats.

MATS' action is bound to make the rearward-facing seat idea advance a little faster.

Speakers for West Coast transport manufacturers have already indicated they are "afraid of the psychological factor" involved in rearward-facing seats. They feel that not this way if passengers on some of the transports equipped with rearward-facing seats, they will ask, "Why aren't all planes so equipped?" Then they will be struck almost flying in ships with passenger forward-facing seats. And manufacturers say, they don't now have to answer passengers who ask, "Are rearward-facing seats?" They are afraid it will make people wish-remembering in a time when no safety is automatically high.

Another airplane experiment "Aero-medical seats are used to being forward and will resist any change."

A spokesman for a foreign jet carrier said there appears to be no question involved. The current model standards of seating are becoming easier and more comfortable, he said, to place safety and load-carrying factors around. He also, why not have seats that turn around? Or group seats around itself? Why not a seat to adjust arrangement?

IATA Views-Notifies, through ICAO and IATA, have already expressed opinion.

The Aero-medical division of ICAO decided last week to continue rearward-facing seats as a recognized perfect form.

IATA takes the position that rearward-facing seats position are a good idea, they are not necessarily better. But before going to the end and trouble of converting equipment in 3,000 transports, IATA wants complete estimate of the operational benefits of rearward-facing seats.

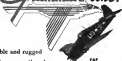
MATS' recent switch to rearward-facing seats is the result of the year

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Seattle Nonsked Presses CAB Fight

A nonsked airline has doubly enlivened the already lively Civil Aeronautics Board on the matter of how to treat the huge irregular airlines. Seattle-based Air Transport Associates, Inc.

• Offered \$1-a-year and service to Alaska (for first 1,000 to a day each way, 3 cents a ton mile over that).

• Appeared in Circuit Court of Appeals a CAB order because the South Alaska coalition found intervention in a temporary final rate proceeding awarding Northwest Airlines \$14,549,000 and pay on its Alaska and North Pacific routes.

► Propaganda Battle—President Anton Henrick of Air Transport Associates is also President of the nonsked group, Air Coach Transport Assn. He has petitioned both his own senate and that of the nonsked into their battle of nonsked against the so-called CAB death order in the nonsked.

The article concerns CAB's proposed amendment to Part IV) of the economic regulations, leaving nonsked to fight more a matter between years of nonsked cities (The U. S. District Court, Washington, D. C., has issued an injunction against enforcement of the CAB regulations.)

The Seattle Select Small Business Committee reportedly recommends that CAB let nonsked fly 14 types instead of five a month under the new proposal.

Busard's offer to carry Seattle-Alaska mail at \$1 a year is the latest nonsked bid for popular and congressional support of the nonsked in this battle for CAB recognition as a reasonable operation (representing high-fare, better-service scheduled airline operation).

On Land or in Air TV Will Be There

United Air Lines is experimenting with television shot by Hi-Vision-beam paratvists.

On the first test flight, reception at 30,000 ft was perfect for 150 miles southeast from San Francisco. Beyond, the signal weakened and finally failed 185 miles out from the coast. The TV image was perfect on the ground, both standing and flying.

The picture received was fuzzy on island, but showed in the plane ground station. Model used was a three-year-old RCA table model with 10-in. screen.

This was a joint experiment by technicians of UAL and Sylvania KRON-TV of San Francisco.

CPA Sees Savings In Comet Operations

Canadian Pacific Air Lines' two all-British jet Comets on order will cut the company's operating costs on trans-Pacific routes by 10 to 20 percent, CPA executive assistant to the president, W. C. Tweedy, told the American Society of Mechanical Engineers recently.

He says that jet would cut CPA costs the first year. But the second year of non-Pacific operation will see "substantial reductions in costs."

Coal savings gain for expected start structure on jet compared with the DC-8.

• Utilization. One Comet can do the work of two DC-8s because it has double the speed.

• Simplicity. Basic design of the Comet is simpler than most prop planes. It needs no propellers, yokes, gearboxes, oil, oil thermal and driving rollers. Jet engine needs less maintenance controls. • Windless. Radical streamlines mean much less maintenance. Military search operations show the weather risk means a 10 percent increase in maintenance and armory life. Airframe also requires less painting.

• Passenger service. Because the plane gets there faster as fast, there is a big saving on food and service.

ANDB Staff Finds Private Industry Jobs

The technical staff of Air Navigation Development Board, having completed review of the military civil all-weather flight development program (Aeronautics Week June 4), under Director of Development Douglas Ewing, has broken up. Ewing and three of his staff go to private industry plus two months. Ewing resigns effective June 15 after the review changed the ANDB program. Four months later, the military and CAA members of ANDB had not found a successor.

Here is the personal status of the six members of the ANDB technical staff who helped launch the intermediate stage of all-weather flight and led the groundwork for development late in the decade and early in the new.

Ewing left ANDB June 15 to become assistant to the director of RCA Laboratories. J. Wesley Lee left June 15 to become coordinator of government projects for Victor division of RCA. Norman Clarke left June 22 to become special operations engineer, Radio Division, Radio Avionics Division K. Goldstein leaves June 29 to become partner and technical director of BAI, CO. Remond Laboratories, Newark, N. J. Lester K. Pluckoff and Henry K. Seal plan to leave later (See sidebar).



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SHORTLINES

► **American Airlines—AA** flew 214,994-916 passenger miles in May, making it the first airline to do more than 200 million in a single month, into vice president R. E. S. Decker reports. The load factor was 74 percent of available seat capacity. May passenger traffic was 33 percent over a year ago and ten miles of 1,146,000 were up 39 percent. June 6 broke the industry one-day record, with 5.6 million passenger miles.

► **Business Air Lines—CAB** has set temporary base rates for Business at 60 cents a plane mile, May-December, 1951, and 50 cents an end after Jan. 3, 1952. Total mail pay, Dec. 76, 1946, through Apr. 30 this year, comes to \$780,706 in the CAB order fixing temporary rates.

► **British European Airways—BEA** flew 19 percent more passenger miles this February than last. Figure is 13,713-947 Aircraft miles were up 23 percent, capacity ton miles down 25 percent, and freight ton miles up 12 percent.

► **British Overseas Airways—BOAC** passenger miles in February were up 47 percent over a year ago, to 41,992,723 Aircraft miles flown were up 3 percent, capacity ton miles up 26 percent, and freight ton miles up 25 percent, and freight ton miles up 41 percent.

► **California Eastern Airways—CEA** is regular carrier earned a net profit of \$55,231 after taxes the first quarter of 1951 on the Tokyo Airlift and other government contracts. This compares with a net loss a year ago of \$4,993. CEA Eastern was not doing overseas work then. Company has four DC-3's operating the Tokyo lift, it also has substantial assistance revenues for work done on other carriers' planes at Oakland. Company now employs a total of 1,250 compared with only 60 a year ago. This includes the training operation at Columbus AFB, which started in April and is presently giving 375 AF students basic flight training.

► **Crested Airlines—Local** streetcar airline's biggest month to date is May this year—will passenger traffic up 156 percent over a year ago and 51 percent over that April.

► **National Airlines—National** passenger revenue in May was 67 percent over a year ago.

► **Northwest Airlines—NWA** profit and loss record for the first five months of

1951 is an improvement over the year before. Last year NWA reported losses in each month through May, with total five-month loss of \$4,287,828. This year, first-quarter losses were \$1,614,337. April showed a profit of \$116,228, and May also made a profit—unexpected at that time.

► **The America World Airways—CAB** carrier recommended that PanAm be allowed to drop Philadelphia as a terminal for trans-Atlantic service. It said TWA should continue to serve the city as direct overseas flights with daily trans-Atlantic service. Both lines want to drop the service.

► **Pan American-Globe Airways—PanAm's** \$511,560 revenue profit for the first five months this year is 50 percent over 1950.

► **Seahawk & Western Airlines—SWW** DC-3 averaged 13 to 25 min. daily utilization in April, compared with an average January-April utilization of 12 to 18 min. These figures are far below Pacific military contract operations and North Atlantic commercial operations.

► **Southern Airways—Southern's** board of directors has elected operations manager Hugh W. Davis to be vice president in charge of operations. . . . Southern carried over 3,000 passengers in May. Southern now has over three 4,000 seats a day between 33 cities in eight states.

► **Texas-Texas Airways—Texas-Texas** has followed PanAm in asking CAB for the return of Control of CAB below after Canada's outbids. TTA also wants to branch out on its own—also seeks expansion east to New Orleans, west to Los Angeles.

► **Trans World Airlines—TWA** has followed American in adding a second overnight transportation as month, doubling the daily coach schedule. Old route is via Chicago. The new one is New York-St. Louis-Los Angeles. It is a daylight service. This gives St. Louis its first morning service in both coasts and its first high-speed air coach in either coast. Both TWA coaches are 80-passenger Constellation TWA also runs a daily New York-Los Angeles Coach DC-4, making seven intermediate stops. . . . TWA service just began in the last two weeks of June with 57,500,000—up 28 percent over last year.

► **United Air Lines—UAL** flew 109,972, 042 revenue passenger miles in May—up 20 percent over last year. Mail ton miles were up 62 percent, express ton up 34 percent, freight declined 11 percent.



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Fishy Press Releases

Overenthusiastic, misreading press releases are beginning to reach aviation editors again. They look back to the early days of the airlines when the fishy publicity boys felt that "anything goes for a story in the next edition."

The Navy recently recalled all of its transports which a major carrier was leasing. Obviously, this was a blow to the company, which was using them to capacity. But the airline's press release had another view of things. The transaction became "the transfer of a complete squadron of 17 four-engine transports" from the line to the Naval Air Transport Service "to help with the Pacific effort. . . . The greatest single contribution of equipment by any United States airline to the military service in the current emergency."

This was no "retrospection." The Navy owned the planes and demanded them all back again.

The same airline some weeks ago had told the press at the end of an assigned flight that it had broken a record between the terminals. But it hadn't. And the line's major competitor made two flights that were faster the same day over the same route. Even these two flights did not break the record.

It need not be a question of whether a publicity man owes more allegiance to the public to whom he releases information, or to the company who pays him. That question is academic if the company demands, first, absolute truth in its dealings with the public.

Aeromex Wings did not use either of these announcements as they were given us. Some papers, without the documents or time to check up, did use them. But they probably won't hide next time. That's too bad for aviation generally, and the one airline particularly.

'Security' for the Russians

Today's lesson in "security" offers a new twist. Weeks ago we told our military editor in Washington that our readers probably would wish more official facts about the Russian military aircraft which started in the May Day fly-by over Moscow.

Finally, last week, our chronicle editor to us back with the startling report:

"The Department of State and Defense are still very uncertain about what Russian aircraft participated. They do admit guardedly that about 200 aircraft of all types participated in the aerial show. Of this number, approximately 80 to 90 appeared to be single-engine jet fighters, presumably the MiG-15. The remainder were bombardment types equally divided between four-engine (jet) bombers believed to be TU-4s and two-engine jet types. No designation for the jet bombers is available."

Unless our U. S. intelligence is worse than we thought, complete reports from our own government's observers

have been circulating in the Pentagon for weeks. It appears the Pentagon has become so accustomed to keeping secrets it now keeps the Russians' secrets too. "Security" for whom?

Where Are the Flying Saucers?

Behind the scenes here at *Aeromex Wings*, the Flying Saucer must keep trying to stay on its head again. We continue to get a drizzle of mail and verbal comments from readers who brood about the "mystery" of the Navy's inflow explosion only this year. It WAS quite a let-down, at that.

The Saucer furnished gay speculation for so long that maybe we all miss them.

Small magazines are beginning to devote space to them again. The reputable publishing house of Harper & Row now brings a book of deep philosophy by Gerald Heard, titled "Is Another World Watching?" Mr. Heard has written other books such as "A Poetics to Paper," "Is God in History?" and "Is God Evident?" So we have run the gamut from that other world bit of other worlds described by Frank Scully in his book, "Behind the Flying Saucers." Before his Saucer effort, Mr. Scully's philosophical and literary achievement had included a treatise titled "Was in Hell." Saucers must appeal to just about all of us.

In the Spring issue of *American Scientist*, a Yale University writer, G. Evelyn Whitehouse, devotes a section of his department to a commentary on Saucers, but offers little that is new.

We have stated Air Force headquarters what they ever did about their Project Flying Saucer. They say it was rejected. But they point out that the aerial defense of the country is still their responsibility. They still will investigate any reports they receive which seem worthy of attention. But they have heard of no sightings since the Navy's explosion.

Have the new wire services been getting such reports but refusing to put them on the wire? No, say our sources we questioned in Washington. They haven't been hearing of any sightings either. Nor have their various local newspaper members or clubs.

We haven't heard of any eye-witness stories since February either. But we shall maintain an attitude of interest, though strictly neutral and impartial. We concede that the Navy's inflow theory probably explained a lot of sightings. We are ready to change our another middle number of sightings to people who were seeing things that weren't there. We also eliminate the flying saucer concentrated in marital disorders. But there still remains some reports from apparently trusted or competent observers that cannot be explained or discounted easily.

We are eye-witnessed. But the next move seems to be up to the Saucers.

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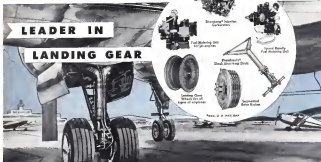
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